COAL AGE

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The Breakdown of the Railroads

BY JOSIAH KEELY

General Manager, Cabin Creek Consolidated Coal Co., Kayford, W. Va.

A large part of the press and the public continue their attacks on the coal industry, maintaining that the present shortage is due as much to inefficient operation of the mines as to the lack of transportation facilities. Many railroad officials have encouraged this belief. Mr. Keely's article here published is a plain and irrefutable statement of facts. What has been true in West Virginia is but a duplicate of conditions that have existed in most of the other important coal regions. Perhaps the railroads did the very best they could; however, too much censure has been directed where at least a little credit is due.—EDITOR.

ANYONE familiar with mine-haulage problems, can, by applying this knowledge, understand fairly well the difficulties of the railroads up to Nov. 1. In underground haulage, it is important to keep the proper balance in mine-car equipment, gathering locomotives or mules, and distance of partings from the faces. This is worked out by counting the number of cars, deciding on the size of the trip for the haulage locomotives, and making due allowance for cars in transit, cars in the working places, and cars switched out for repairs, or filled with material and slate for unloading. If you have just the right number of mine cars, the making of an additional parting may disarrange the whole scheme and hinder the haulage all over the mine. But new motor extensions are always necessary, so equipment is added from time to time to take care of an increased number of partings.

You have two mines with the same number of men and the same number of cars, but if one has a greater number of partings than the other, the larger tonnage is apt to come from the mine of the fewer gathering points.

If the main partings are pushed up too near the faces, the mules or gathering motors are waiting on the haulage locomotives, or, if the partings are allowed to remain behind, while the faces advance over a thousand feet, the mules are overworked and the haulage motor wastes time waiting at the parting on the gathering of coal from the faces. If car equipment is not increased to take care of the new partings the size of the trip is cut down, and locomotives are wearing their tires off rushing around with small trips, or else men are waiting on cars.

The balance is changing all the time, the size of the trip often depends on the number of loaders on a parting, or it may occur that the machine men need cars faster than pick men. It is the resourcefulness of the mine foreman that is called upon to meet these varying situations, but it is up to the superintendent or the manager to meet the call for equipment.

Let Us Apply These Principles

in a general way to railroading. Every time a siding is put in for a new mine, it is analogous to putting an extra parting inside a mine, a new distribution of railroad cars is necessary, and, as there has always been a car shortage when coal business has been brisk, every other mine operating along the same line contributes from its own car supply toward making up the allotment for the new mine.

One has only to look over the new mines of the past year to see that hundreds of these new railroad sidings have been put in with very little new railroad equipment in the way of rolling stock to take care of them. So, although the total tonnage hauled has not been far behind previous years, it has been gathered from more mines at the requirement of more tonnage miles, and all mines have had poorer service.

This cutting down of the working days and the lowering of earnings of the miners gave plausibility to their claims of inadequate wages; while engines were running from mine to mine with small trains of cars and making overtime, forming a basis for the demands of railroad employees.

A very good illustration of the railroad situation attracted attention over a year ago when Cabin Creek, Paint Creek and Coal River in West Virginia, were wiped out by a cloudburst, immediately losing a combined tonnage of a quarter of a million per month. The railroad lost hardly a ton of its two million per month, which simply meant that it had supplied the available cars to other mines which had not been receiving an adequate supply.

Yet we are told that the railroads "organized" immediately after the war declaration to take care of the increased tonnage demands. Here is the way one railroad "organized." In January of 1917, they were supplying the mines with about ten allotments per month and taking on newly developed mines every day. That is, from railroad reports, they were giving the mines about a ten-days' run per month. They cut the allotment all around twenty per cent. and, with the reduced allotment,

THE BREAKDOWN OF THE RAILROADS—*Continued*

were able to show more working days. Still they were giving the mines but half time, and, to increase their showing in this respect, they made another cut in allotment, so that in October, the fifteen allotments furnished gave exactly the same number of railroad cars as was given in January, but a showing of fifteen days run instead of ten. It is true that some of the mines were allotted so low that an operation listed as a 250-ton mine was frequently able to load 350 tons, but "organization" showed that the railroads were increasing month by month in ability to supply the mines.

In the Meantime

with the Spring of 1917, wages began to advance around the mines, and although the Railroad Brotherhoods "got theirs," the railroad section men, responsible for keeping up the track sections, were not advanced in proportion. In fact, the wage of the section-hands was left at about half the minimum wage of the miner, which resulted in a wholesale desertion of these men to the ranks of the miners, making the mines more able to load coal, while the railroad tracks were allowed to get in such bad shape that frequently mines were held up by wrecks and slides, to say nothing of sidings being so poorly kept up that derailments at the mines were of daily occurrence.

Stretches of track five or six miles in length had scarcely a splice bar with its full quota of bolts, and there were so many rotten ties that "spread track" furnished its quota of derailments. So thorough was the disorganization that not infrequently an excessive number of empty cars were placed at one mine while a shortage existed at another right in sight of it. Train loads of empties were reported on the way and miners were ordered to work only to find that cars would not arrive till noon. Material necessary for operating mines was allowed to stand around, or go astray. The month's feed for mules at one group of twenty mines was twenty days moving thirty miles, while feed was being hauled ten miles in wagons to keep the mines going.

But in spite of the general disorganization and the camouflaging of allotments, the mines did manage to keep going until Nov. 1. Then something began to happen, and by the middle of the month it had happened. The advance in miners' wages had gone into effect, the increase in the price of coal was allowed, and all operations stopped. At first there was suspicion and distrust. It was approaching the time for the Christmas pay to be earned. Rumors were out that the operators were stalling on account of the wage increase. Knots of idle miners could be seen everywhere discussing the sudden stoppage and searching for a satisfying explanation.

About December 1

the train crews began talking, telling the miners that there would be "nothing doing" before the first of the year. Telephones got busy and operators were assured that there was only a temporary "congestion" and that the train crews would be reprimanded for exciting the miners. Nevertheless, miners left in crowds seeking other employment. The Virginian Power Plant, furnishing power to scores of mines, had trouble getting water supply and was shut down two days. The fact was duly discussed by the newspapers, and much solicitude was shown that the mines should be shut down on this account. Apparently the press had not noticed that the mines had been shut down for a week for lack of cars, and the railroad apparently did not know that there was no power, for they suddenly found that they could supply some cars on these days, an ability which they had failed to exhibit before or since. Anyway, the remarkable thing is that no one except the operators seemed to feel that anything exceptional was wrong with the railroads.

Following two weeks of almost absolute idleness at the mines, the monotony was relieved by the receipt of appeals from the Fuel Administrator and the Governor of West Virginia for miners to show their patriotism by working through the holidays. Still only a few articles appeared in the press to show that the general public was aware of the situation. A very moderate letter of Mr. Wheelwright of the Consolidation Coal Co. came out showing quite plainly what was wrong at the mines when no cars were available, and there were rumors of pooling, and the appointments of State Fuel Administrators, but still, aside from some criticism of priority orders, nothing adequate was offered for the sudden stoppage of business.

And So the Old Year Goes Out and the New Comes In

with the sudden loss in December of a million tons of coal. The prediction of a few freight crews came to pass almost to a letter, yet the head officials and the general public apparently do not know what was the trouble.

Appeals were made to all miners to work through the holidays, and now that the holidays are over to save their money! Is it possible that coal operators have been so discredited that their complaints cease to be taken seriously? It also appears that the press and the public are going the even tenor of their ways, continuing to murmur the oft repeated formulas, "Keep Working," "Keep Saving," "Your Country Needs Coal," while the railroads are completely broken down and thousands of miners, having lost their Christmas pay, are still hanging on at the mines hoping to get a chance to load coal.

Can It Be Possible

that it is necessary to so discredit the miner in order that the railroads may not lose the confidence of the public? Head lines would not be too late even yet, but a month of blame has already been borne unjustly by operators and miners. There has never been any serious doubt on the part of those who know, that the coal mines of the country could put out all the coal needed if given a fair chance.

IDEAS AND SUGGESTIONS

Precautions To Be Observed in Coal Mines During Cold Weather

BY FREDERICK B. HICKS
Kingston, Penn.

It is the duty of every official inside or outside the mine to call special attention to the precautions necessary at this season of the year to safeguard mine property against fire and to see that all fire-fighting apparatus is protected against freezing and breakage. The damage caused by frost sometimes affects the entire fire protection system sufficiently to prevent its efficient use.

All hydrants and valves should be examined carefully every three hours by the chief of the mine's fire department, and they should receive this attention both day and night. The valves and hydrants should be oiled with a heavy mineral oil which will not corrode the brass. All hydrants on standpipes and all Y or branch hydrants should be opened after the pipes are emptied, to let out any entrapped water which may have leaked past the valves when the pipes were full, care being taken that the drip valves of the post hydrants are in good condition.

Rotary pumps should also be oiled, and if they are exposed to freezing weather should be reversed to empty them of water. Pipes exposed to the frost should be emptied too, care being taken that the water is let out from above the check valves. Those who are placed in charge of such apparatus should know when the gate and drip valves are in good order.

ADVICE ON CARE OF AUTOMATIC SPRINKLERS

Drip valves should be marked by an arrow showing how they should be turned to open. Hydrant houses should be arrayed for winter service, and lanterns and other appliances should be put into condition and kept hanging convenient for immediate use. If necessary, changes should be made to the doors of the hydrant houses, so that they cannot readily be obstructed by ice.

Automatic sprinklers that cannot be kept warm should have their petcocks opened after the main valve is closed, and the water slowly drawn off at the drip pipe, in order that the sprinklers should not be rendered liable to leakage by a sudden change of atmospheric pressure. This may happen if the water is drawn off rapidly. When it is found necessary to close any sprinkler valve, every member of the colliery fire department should be informed of the fact and also that the valves must be again opened in order to operate the sprinkler in time of fire.

Especial care should be bestowed upon the valves of an automatic sprinkler system. Frequently these valves are shut when they should be open. Valves which are to be kept open should be secured in such position by a leather strap (not a chain) passed around the pipe and one of the spokes of the handwheel of the valve, the ends of the strap being held together by rivets or a padlock. This strap should be sufficiently loose to enable the handwheel to be moved half a turn, in order that the valve may be turned fully open at any time. The valves should be kept a quarter to a half turn from being full, so as to render inspection possible without removing the strap.

On new sprinkler installations it is recommended that all valves be provided with an indicator showing whether they are open or shut. This is important. It is only a matter of chance that the numerous instances of close sprinkler valves have been revealed by the company fire inspectors and not by fires.

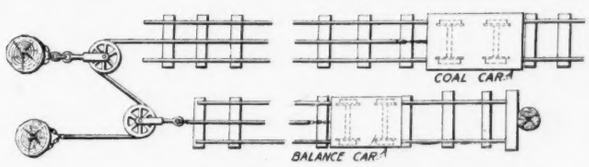
Thousands of dollars' worth of buildings and equipment could have been saved annually in the mines of this country if the practice set out in the foregoing paragraphs had been adopted as part of the plant routine.

Counterbalanced Room Haulage That Saves Considerable Man-Power

BY J. M. RODDY
Springfield, Illinois

A reference is made in a recent issue of *Coal Age* to the effect that miners in the anthracite region use light, bottomless boxes into which they shovel coal, permitting these boxes when full to slide down the room on sheet iron. When empty, the boxes are pulled back to the face of the chamber for reloading. It seems to me that this method entails the loss of considerable man-power that should be saved if possible.

I have had no experience in the anthracite region, but show in the accompanying sketch a system that I think would be favorable under the conditions there encountered and one that should give good results. Two cars are employed, one for a counterbalance, while the other is a coal car. The coal car should be constructed so as to discharge its contents to a waiting mine car when the lower end of the room is reached. The counterbalance will pull the empty coal car up the incline again, and so on continuously.



THIS HAULAGE SCHEME CONSERVES MAN-POWER

This system could be operated successfully on a slope of 1 to 4 or 4½. The rails should be laid on the coal-car line the full length of the room and the ties or sprag track sunk well, so as to keep it in place. The travel of the counterbalance need be only one-half or one-quarter that of the coal car, as shown in the sketch. The traveling speed of the coal car will of course be two or four times that of the counterbalance.

An Up-to-Date Coal-Mine Power Plant

By DEVER C. ASHMEAD
Tarrytown, N. Y.

SYNOPSIS—*A new central power plant just put into operation, taking the place of three old plants. Description of building and machinery, with details of construction and some kinks used. A simple, but good dam and reservoir insures an adequate water-supply. An unusual outside arrangement for a transformer station at one of the substations. Some interesting figures on power production.*

AT CLYMER, Indiana County, Pennsylvania, the Clearfield Bituminous Coal Corporation has recently completed and put into operation a modern power plant. The erection of this plant was started Apr. 1, 1916, and the installation was completed in October, 1917, since which time it has been furnishing power to the company's mines.

When projected the plant was designed to furnish power only to the Barr and Sample Run slope mines in the Clymer region and to the concern's West Branch mine in the Barnesboro region. However, the plant not only did away with the individual power plants installed at the three operations just mentioned, but in addition furnishes power to the Pennsylvania Public Service Corporation. The coal company is now making arrangements to connect its Clymer plant with its Rossiter plant, which is 18 miles away. At present the Clymer plant has a capacity of 2000 kw., but complete arrangements have been made for doubling the present capacity by the addition of a 2000-kw. turbo-generator and a sufficient amount of boiler-horsepower, together with the necessary auxiliary machinery.

In sinking the concrete foundations for the power house, which is a substantial yellow brick structure 121 ft. 6 in. long by 86 ft. wide and 38 ft. 8 in. high, and very attractive in design (see Fig. 1), it was found necessary in some instances to carry the excavations down as much as 23 ft. in order to obtain a solid footing.

The coal seam dips from the rear of the boiler house toward the front at about a pitch of 6 per cent. At the middle of the boiler house the basement floor came on the blossom of the coal. As this did not give sufficient bearing, it was found necessary to use an inverted arch constructed of reinforced concrete to give the necessary support. The reinforcing used was thoroughly cleaned old discarded strap rail $\frac{1}{2}$ x 2 inches. In the spring of 1918 the company intends to lay out the grounds surrounding the boiler plant as a park, such as it has at the Rossiter power house.

The interior of the building is painted white. The floors are of reinforced concrete. The sash is of steel with wire-glass lights. In Fig. 1 it will be noticed that the main approach is not finished, but it is the intention to build a simple and attractive approach in the spring.

The stairways are of steel and concrete, and are of an interesting and unusual construction, as is shown in Fig. 2. The two stringers are made of 10-in. 20-lb. channel-bar sections. A piece of angle bar 9 x $1\frac{3}{4}$ x $1\frac{3}{4}$ x $\frac{3}{16}$ in. is bolted to the flat side of the channel-bar and the angle turned up for the treads to rest on. The treads are made of two pieces of angle bar of the same cross-section and of sufficient length to reach both stringers. These angles are bolted with one side down on the crosspiece and the other side forming the face of the tread or the back of the tread as the case may be. Between these angle bars a piece of steel lath is fitted and concrete is poured in on top, filling the space between the angle bars and making the top of the tread concrete. This affords an absolutely fireproof stairway, there being nothing but steel and concrete used in

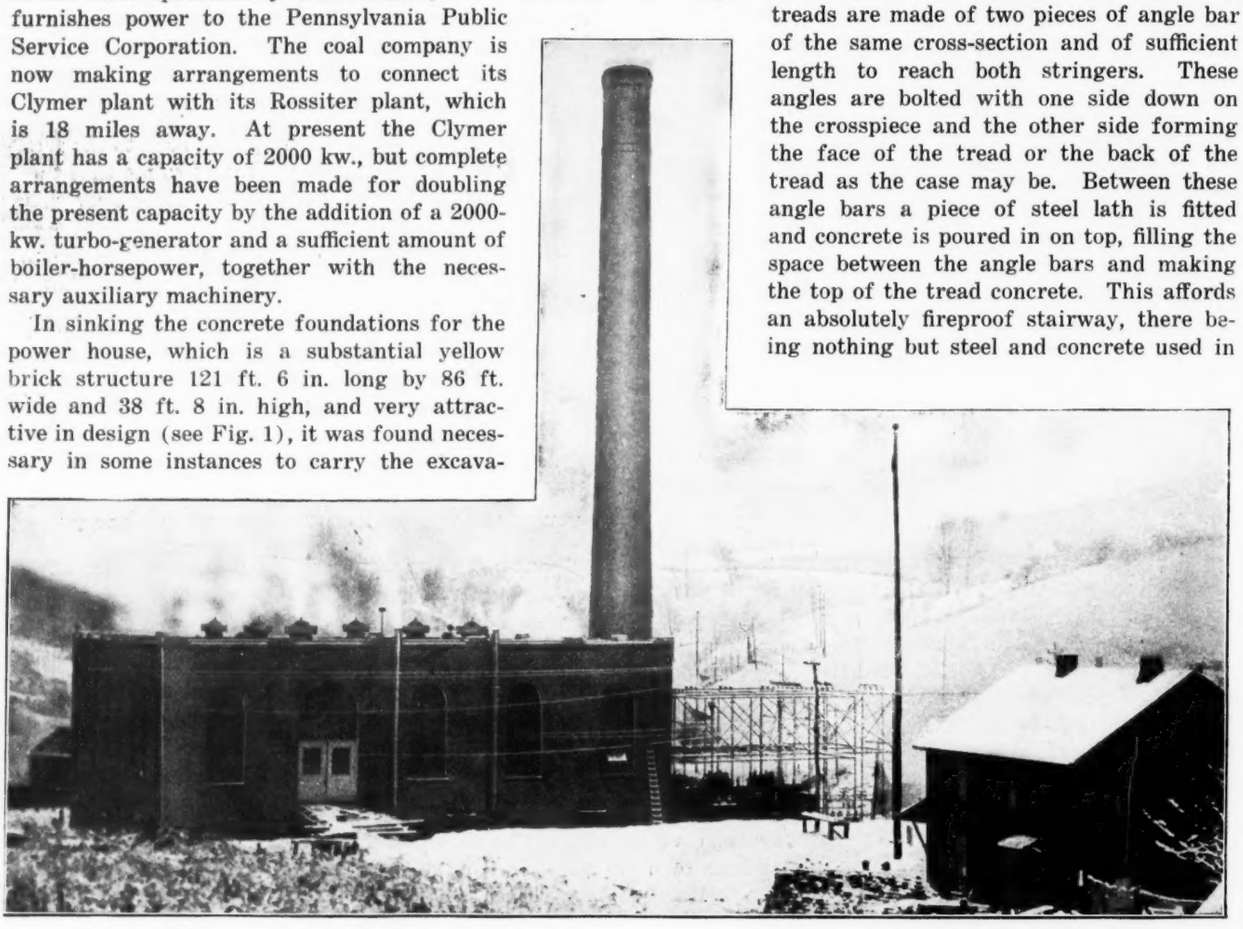


FIG. 1. VIEW OF CLYMER POWER PLANT, SHOWING OUTSIDE TRANSFORMER STATION

its construction. The roof trusses are of steel, and the roof itself is covered with Johns-Manville five-ply asphalt-and-asbestos roofing.

The boiler room of the Clymer power house has every modern convenience for the economical production of power. It is 86 ft. long by 78 ft. wide and contains

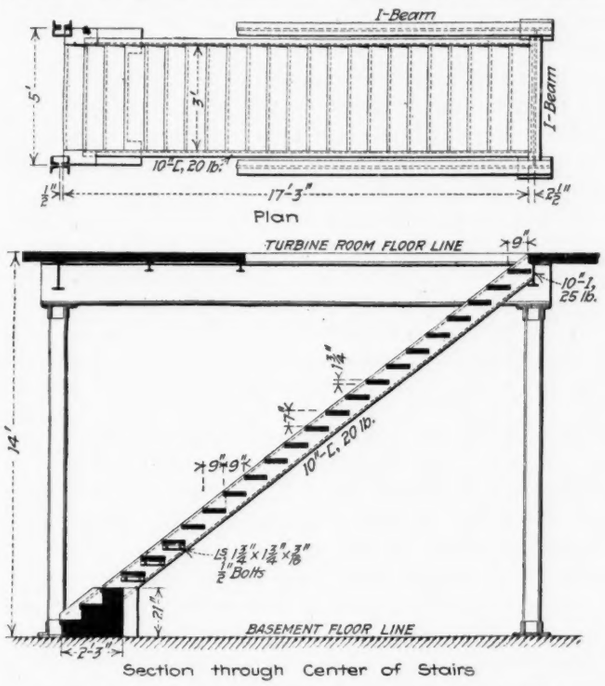


FIG. 2. STEEL STAIRS USED IN POWER HOUSE

four boilers, coal bunkers, feed-water heaters and room for four additional boilers. The draft apparatus, feed-water pumps and coal crushers have been installed in the basement, where provision has also been made for the handling of ashes.

Let us follow the coal from the time it comes into the power house until it leaves in the form of ash, and then follow the water until it is converted to steam. The mine car loaded with mine-run coal, is brought by an electric locomotive directly from the mines to a coal hopper, and the car is dumped over a Phillips crossover dump. The empty car then runs by gravity back to the empty track.

Details of the Coal-Handling Machinery

The coal in the hopper is then picked up by the apron feeder, Fig. 6, and carried 18 ft. to the two-roll crusher. From this crusher it is taken in the bucket elevator, which is 58 ft. long, to the top of the boiler house, and distributed by means of the scraper conveyor to the coal bunkers. As the bucket elevator takes the coal to a point halfway between the two coal bunkers, the scraper conveyor is made reversible so that it can supply both bunkers. The scraper conveyor is 56 ft. long.

The apron conveyor and the crusher are operated by a 15-hp. motor, the bucket elevator by a 7½-hp. motor and the scraper conveyor by a 5-hp. motor. Friction clutches are arranged on all three conveyors and the crusher, so that when it is necessary for men to work around the machinery they can shut down the operation of any piece, which cannot be started from the main floor unless the clutch is in, thereby protecting the workman. Ordinarily the operation of the conveyors is controlled by switches on the main floor of the boiler room, the switches starting or stopping the motors. Part of this coal-handling machinery is shown in Fig. 6.

The coal bunkers themselves are of considerable interest. They are made of steel, to the inside of which have been welded wire nails. To these nails steel lath has been attached, and then cement applied by means of a cement gun, until a thickness of 1½ in. was obtained. This makes a solid concrete lining for the bunkers. The outside of the bunkers is shown in Fig. 3. All the coal-handling apparatus was furnished by the Link-Belt Company.

By means of chutes the coal is delivered from the bunkers to Jones underfeed stokers (Fig. 4) which feed the coal to four 500-hp. Keeler water-tube boilers operated at 175-lb. pressure. With this type of stoker, it is necessary to take the ashes out of what is ordinarily the coal door. The ashes are raked out onto the main floor of the boiler room and dropped through an ash opening into steel cars in the ash pit. These cars are run to the outside and dumped. A double track has been provided, one for the present boiler equipment and one for the future installation.

Mechanical Draft Apparatus Is Used

The draft for the present set of boilers is supplied by a 150-ft. brick chimney 8 ft. 6 in. in diameter. A second chimney will be built as soon as the second battery of boilers is installed. The draft supplied by the chimney is augmented by a Jones mechanical draft apparatus.

The arrangement of the blower fan for this mechanical draft is rather interesting. Two vertical self-oiling

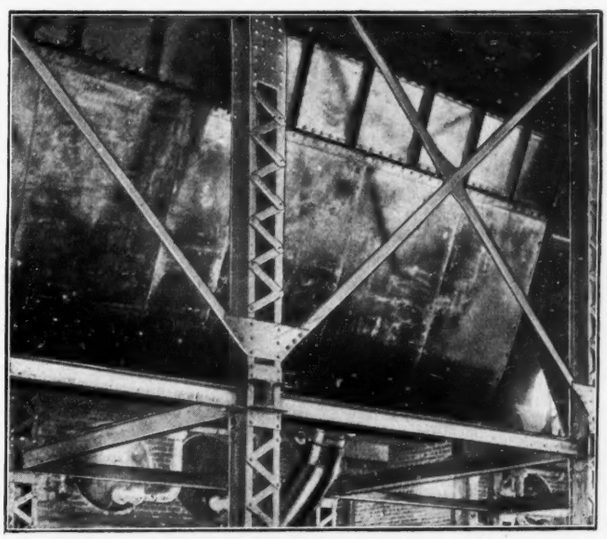


FIG. 3. COAL BUNKER; 75-TON CAPACITY

engines built by the Troy Engine Works have been provided for driving the fan, one engine at each end of the mainshaft. The arrangement is such that in the event of engine trouble the fan can be uncoupled from the engine driving it by unscrewing four nuts on a flange coupling and removing the bolts, shifting the fan ½ in. and coupling to the engine at the other end of the fanshaft. The whole change can be made in five minutes.

The feed water is supplied from a reservoir (to be described in Part II of this article) to two 1000-hp. Cochrane open feed-water heaters. From here it goes to a hotwell tank which contains a sufficient supply to run the boilers for 15 min. in case of an accident to the water line or the supply. This would give ample time to shut down the plant and draw the fires. An automatic valve

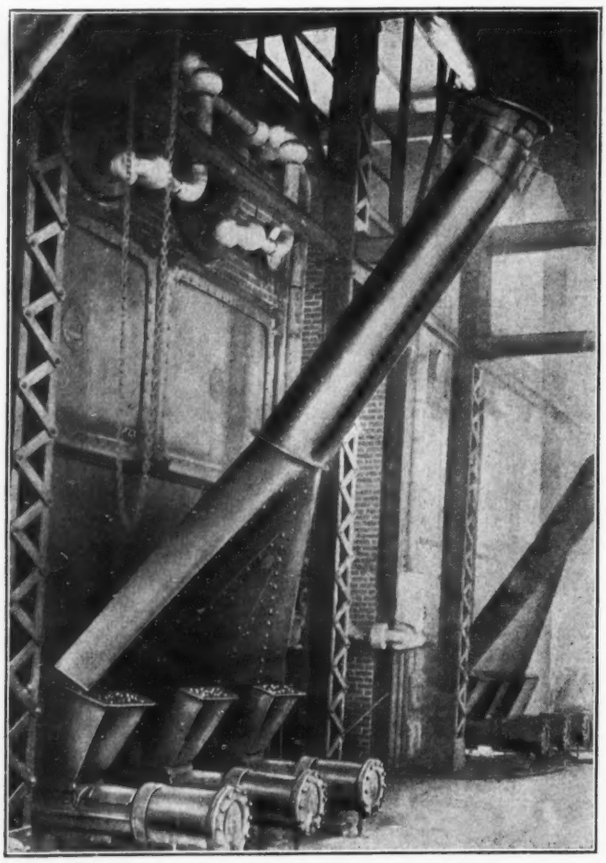


FIG. 4. JONES UNDERFEED STOKERS

is provided in the hotwell tank to keep it filled to the proper level.

From this hotwell tank the feed water is supplied to the boilers by two Alberger 3-in., three-stage, type S turbine-driven centrifugal pumps, which operate noncondensing. The operation of these pumps is regulated by a Foster feed-water regulator, which is so arranged that in case the fireman should neglect to give the pumps the proper attention, such as cutting off the feed water to the boilers and not stopping the pumps, the regulator will automatically shut down the pumps by closing a valve in the steam line, which is operated by the pressure of the water. This prevents damage to the pumps from too high a pressure.

The blower machinery, the feed-water pumps and the crushing machinery are located in the basement of the boiler house. The company is now building light concrete partitions to separate the crusher machinery and its attendant dust from the pumps and mechanical draft systems. At present the blower fan is sucking up the coal dust and blowing it to the boilers, but some of it leaks into the boiler room and some gets into the blower machinery and the pumps, causing unnecessary wear.

The system of piping is extremely interesting. The main steam headers, Fig. 6, are arranged in a ring. The five valves are placed so that in case of an accident to any part of the leader line that particular section can be cut out. As soon as the new battery of boilers is installed there will be a second connecting ring, further extending the plan of being able to cut out any part of the header system without shutting down.

Each boiler has two valves on its individual header, as shown in the figure, so that in case men are working on the inside of the boiler they will have a double protection against carelessness. The piping is extra heavy and flanged Vanstone joints are used.

The turbine room, which is 86 ft. long by 43 ft. 6 in. wide, contains two type ATB, 1000-kw. (125-kv.-a.), 80-power-factor, 3600-r.p.m., 2300-volt, 60-cycle, three-phase General Electric turbo-alternators with separate excitation and arranged to operate condensing. The turbo-generators, exciters and switchboard are installed on the main floor, the condensers, circulating and dry vacuum pumps being on the basement floor. A plan and cross-section of the turbine room is shown in Fig. 6, which is a diagrammatic view of the entire plant.

Excitation is had from a General Electric motor-driven exciter set consisting of one DLC-6-35-kw. 1200-r.p.m., 125-volt, compound-wound exciter direct connected to one 1-6-50-hp. 1200-r.p.m., 220-volt, 60-cycle, three-phase form K motor. This exciter is further augmented with one General Electric type CC-2-35-kw. 3600-r.p.m., 125-volt, direct-connected, turbine-driven exciter of the noncondensing type.

The General Electric type H-60-20-kv.-a., 2200/220-volt, 60-cycle, single-phase, oil-cooled transformers are used to step down the generated voltage for use with

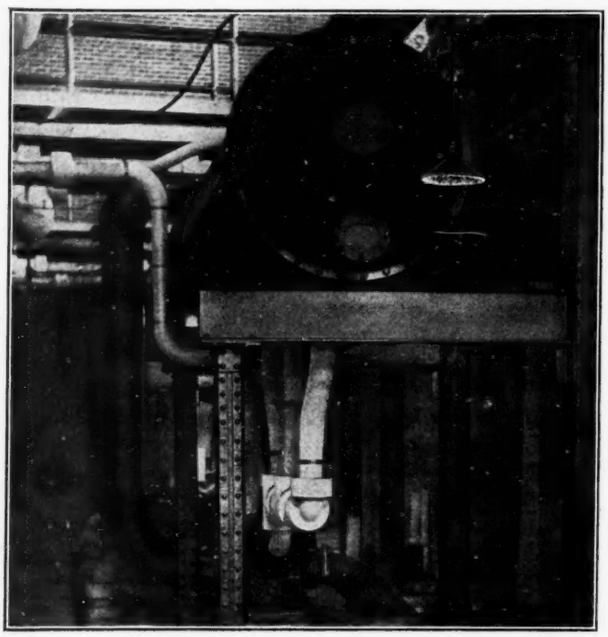


FIG. 5. SHOWING THE CONDENSER EQUIPMENT

the motor-driven exciter set and the motors used to drive the coal-handling apparatus.

The switchboard is constructed of a natural black slate and consists of one two-circuit exciter panel, one transformer and Tirrill regulator panel, two alternating-

current generator panels, two blank panels for future generators, one total load panel, three step-up transformer panels, and two blank panels for future feeder lines. Fig. 8 shows the interior of the generator room with the switchboard in the background. The switchboard is so arranged that all the oil switches are mounted on a pipe framework 6 ft. back of the panels and connected to switch handles by means of levers and bell cranks. A 15-ton Morris Brothers double-beam hand-operated traveling crane, with a chain hoist, has been installed in the turbine room.

One particularly interesting feature is the unusual arrangement of the air ducts for carrying cold air to the generators for their cooling. Fig. 7 shows the details of these air ducts. At the Rossiter power plant of this company a great deal of trouble was had with the generators due to the formation of ice on the outside by the condensation of the moisture in the air of the room, the generator being made too cool by the ice-cold air from out-of-doors, causing the condensed moisture to freeze. In other words, the generator acted as a suction fan and sucked in more air than it could heat.

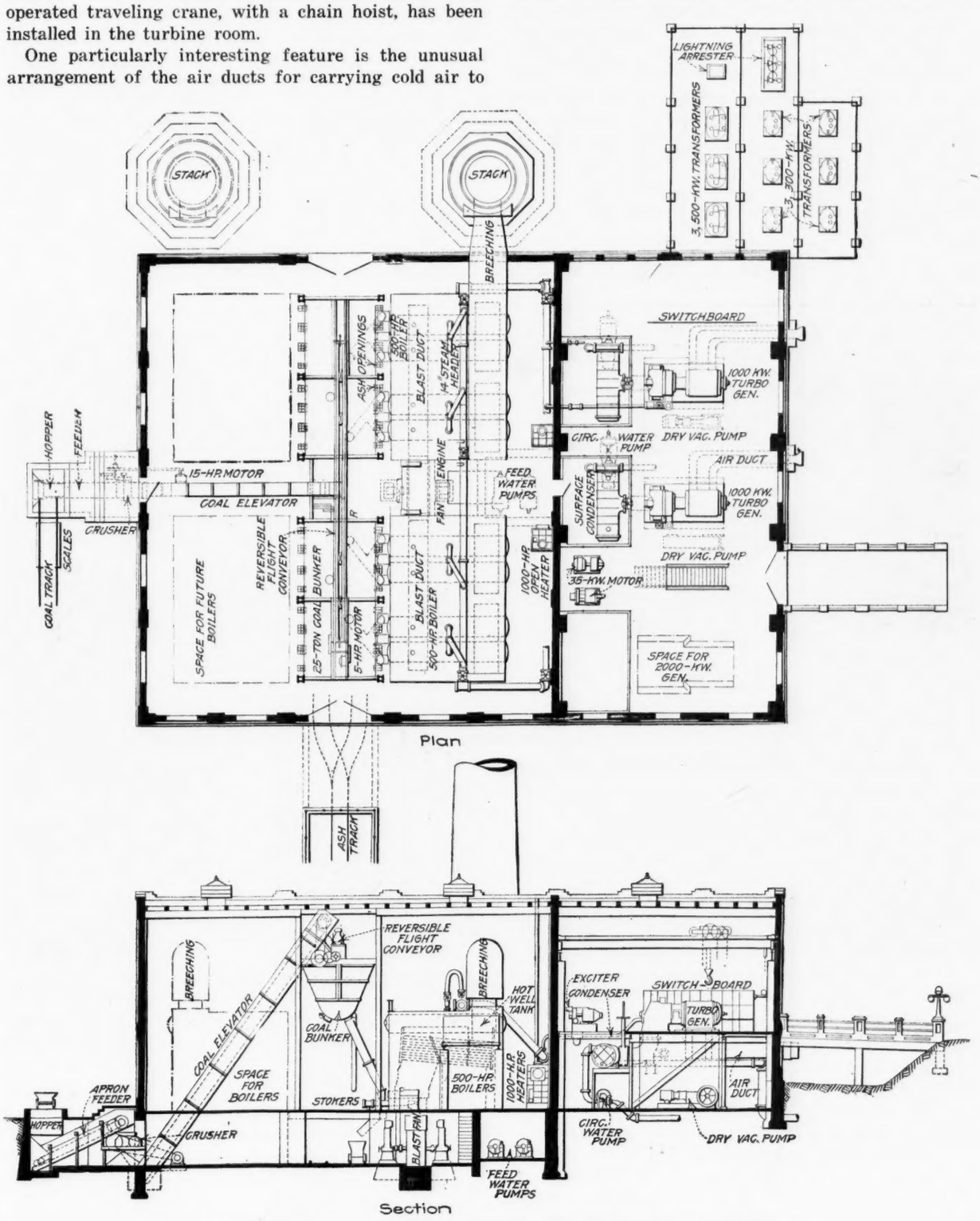


FIG. 6. PLAN AND CROSS-SECTION OF THE CLYMER POWER PLANT

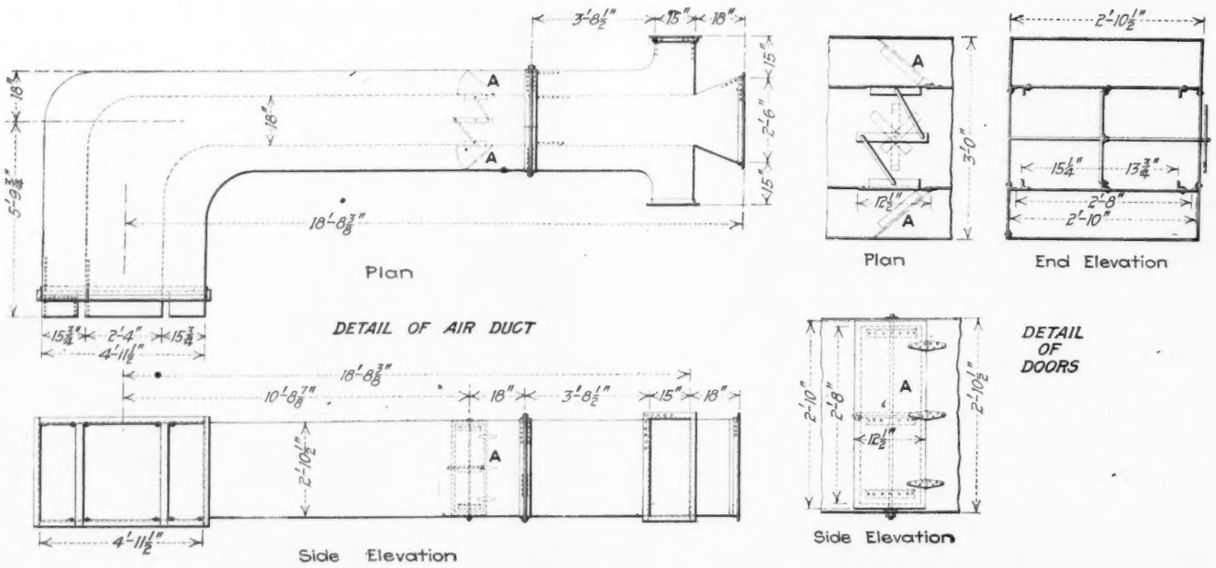


FIG. 7. DETAILS OF AIR DUCTS THAT COOL THE GENERATORS

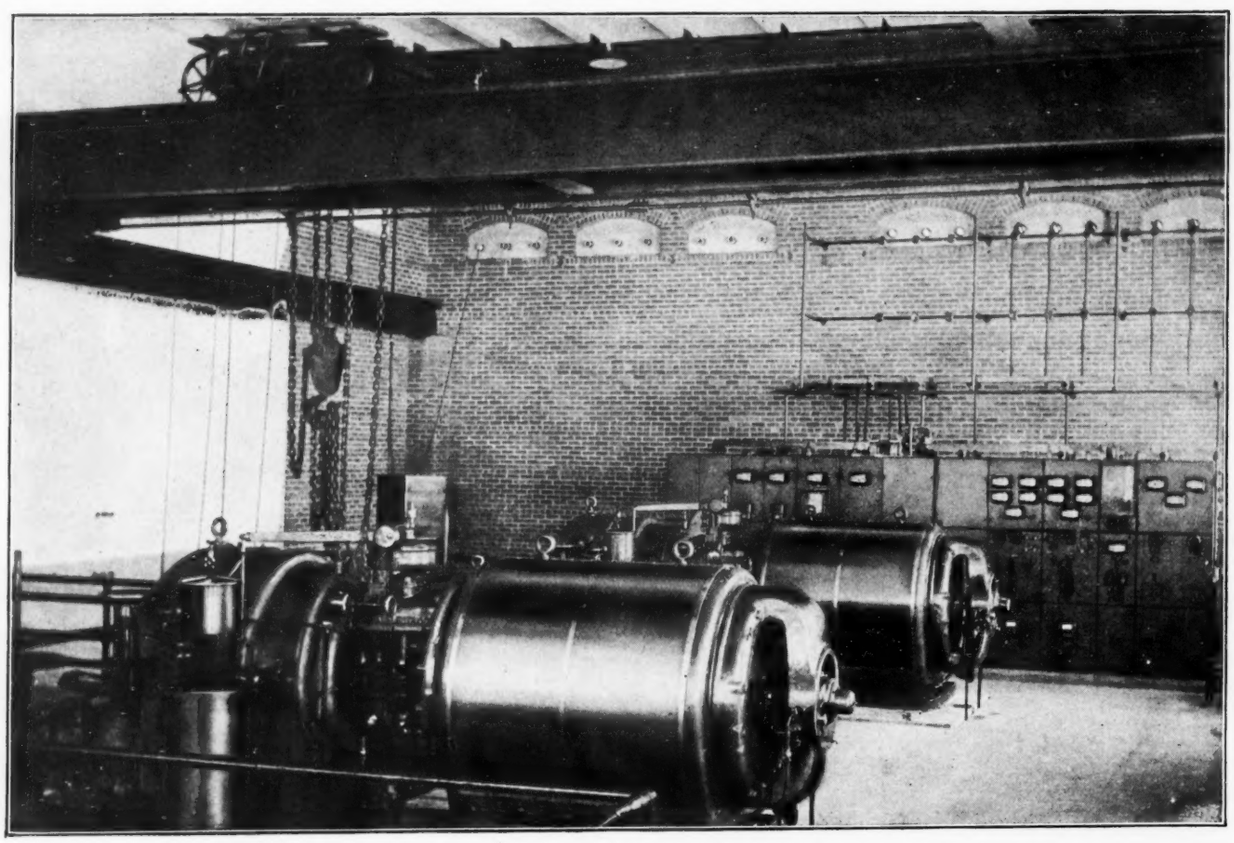


FIG. 8. PART OF GENERATOR ROOM, SHOWING GENERATORS AND SWITCHBOARD

In order to do away with this trouble, the door *A* was placed in each side of the intake air duct, as shown in Fig. 7. These doors are so arranged that the amount of air passing to the generator can be regulated by opening or closing them, thus maintaining an even temperature.

The condensing equipment consists of two Alberger. "Spiro-Flo" surface condensers together with two 10-in. two-impeller turbo volute pumps direct connected to and driven by Alberger-Curtis noncondensing steam turbines with two 2-in. Alberger standard volute condensate pumps mounted on the end of the pumpshafts. There are also two 8x16 12-in. Alberger horizontal dry vacuum pumps. A vacuum of 27½ to 28 in. is obtained with these pumps. (See Fig. 5 for illustration of the condensers and the two-impeller turbo volute pumps and turbine, and also the volute condensate pumps.)

[The next installment of this article will describe the dam and reservoir of the Clymer plant.—Editor.]

(*To be concluded*)

Efficiency Engineering for Coal Mines*

By C. H. ELSOM
Charleston, West Virginia

SYNOPSIS — *The art of coal mining today involves several specialties. Only by employing specialists who are capable of securing the best results in their various lines will the overall efficiency of the entire mine be made a maximum. One of the most important specialties involved is here discussed.*

NO PROGRESSIVE man or organization of men is bound by past performances. Opinions must of necessity change with conditions, and old methods must be revised if advancement is to be attained. Progress and stagnation are of opposite polarities: antiquated methods must give way to new.

An astronomer fixes his telescope on a distant star, and as his observations progress the angle of the telescope must be constantly shifted, not because of any motion of the star, but because the earth moves. In like manner thinking men, men who do things, are quick to realize the changes going on about them. They know that precedents are precarious and that new ideas are essential to success.

Naturally this change is being reflected in the coal-mining industry, and higher efficiencies, both with respect to labor and equipment, as well as better ways of accomplishing the same results, are occupying no little thought and attention on the part of the coal operator.

Is Efficiency Engineering for Coal Mines Justified?

In arriving at a decision as to whether efficiency engineering for coal mines is justified, we must determine whether by means of it there results an actual saving in dollars and cents. The best definition ever given for an engineer is "one who can do for one dollar what any fool could do for two," and it is doubtful if there is any field of endeavor involving an equal amount of capital and doing the same volume of business as the coal industry where so many two-dollar men have been employed. It has been correctly stated that the average operator has a good working knowledge of civil and mining engineering, yet when he opens a new mine a mining engineer is the first man he employs. He admits that he knows little or nothing about electrical engineering, yet he will intrust this work to an untrained electrician and rely on incompetent or biased advice. For this reason, this paper is devoted chiefly to the discussion of the efficiencies that can be brought about by the electrical engineer.

The coal industry has developed rapidly, and many can no doubt recall the time when the only equipment needed to start a mine was a mine car, a mule, a pick and a shovel. This equipment was crude, and it was found necessary to electrify the mine in an effort to increase tonnage. Thus each operation soon had its individual power plant, with direct-current equipment. The next step was the isolated alternating-current plant, and then the central station with its high-tension distributing lines and the substations located so as to supply power near the point where it was to be used. The advantages of this arrangement were an unlimited source of power, improved voltage, continuity of service and a shifting of responsibility to the shoulders of others specially trained for this work.

On the other hand, it soon became apparent that it made a radical difference in the power bills whether a motor-generator set or a rotary converter was used as converting apparatus, whether the fans and pumps continued to be driven by direct-current motors or put on alternating-current service, whether the hoist motor was put on direct current or alternating current. In short, it was found that a whole new situation presented itself for solution, and the man who thought quickly and correctly, as well as acted promptly, was the one to effect the greater saving. There are many yet, however, who do not realize the importance of adopting new methods, and of getting out of the rut.

Costly Errors Are Frequent

To cite a familiar example, the confusion of ideas with reference to *power* and *voltage* is such that errors are frequent and cases are known where a second generator was installed when it was desired to improve the voltage at the end of a long transmission line. Had this additional expenditure been put into a substation at the end of a transmission line, the object in view would have been achieved. I know of a substation containing two large motor generators located at the drift mouth of a big mine. The present workings are two miles from the substation, and in the center of the workings the voltage is so low that the coal cutting and all mining operations are carried on with extreme difficulty; furthermore, 45 per cent. of the power purchased is lost in conversion and transmission. Simply relocating one of these motor generator sets so as to have one at each end of the haulage system would result in an improvement in voltage, an increased production and a decrease in maintenance and power bills, due to lessened losses and improved voltage. This change would cost several thousand dollars, but the saving effected thereby would be such as to equal the expense in a year and a half.

In the installation of trolley, feeders and bonding the most expensive method is to allow these same incorrect ideas to influence the plan of procedure. Other instances of inefficiencies may be cited, such as one mine where a short grade caused heavy peaks on the power house. A few hundred dollars would have eliminated this trouble by cutting down the grade, but the cause of trouble in the power house was attributed to lack of power, and something over four thousand dollars was spent in additional equipment, which further resulted in much greater operating expenses. Other somewhat similar cases of inefficiencies are numerous. Poorly designed power houses and substations, the wrong solution of converting apparatus, fans, tipple motors, locomotives, etc., are too numerous to mention.

*Paper read before the West Virginia Coal Mining Institute.

Similarly, the mining engineer and the practical coal-mining man has his special field to cover, in which efficiency engineering is equally as important. In other words, the efficiency engineer takes advantage of *all* facts that will accomplish more with less money, as opposed to notions or ideas of untrained men which please the originator of these ideas but cause a loss in the revenue.

Time does not permit a detailed discussion of the various phases that an efficiency engineer has to consider in relation to mining installations, but a few practical illustrations are given to show the need of more thought and attention to the power end, the heart or prime mover of the whole system.

A few years ago a power plant was installed in Virginia to furnish power to coal mines and to eliminate the isolated power plants. This company at first met with strong opposition, but a few companies thought the idea a good one, and the results obtained by them started the operators thinking along the line of central-station power and its advantages and disadvantages. Today there are in the coal fields of this section seven large central stations, and another company recently organized, thus giving practically all coal companies the opportunity of purchasing power.

If such enormous expenditures of money have been made in these utilities, and if so many operators have encouraged them, why are there any private plants in existence? If they are a good thing for so many coal companies, why would not purchased power be advantageous to your mine? Why are you uncertain relative to this question? The reason, in my mind, is very apparent. There is still a wide difference of opinion relative to the advisability of purchased power, not so much from the advantages of its flexibility, ease of control, etc., but from the cost of operation.

Some Points on Purchased Power

Relative to the cost of purchased power, why do some of your neighbors tell you it is cheaper than your own plant, and others that central-station power is higher? There is a logical reason for this discrepancy of opinion; in fact, undoubtedly both of your neighbors are correct for their particular plants.

The question of purchased power, and why both of these opinions are correct, was discussed fully in an article in the July 1, 1916, issue of *Coal Age*, by H. P. Musser and F. B. Lamb. It was there plainly shown that it is just as absurd to make a decision relative to the advisability of purchased power from comparison with the results obtained from any other company as it is to assume you need a 15-hp. fan motor to ventilate your mine merely because there are a large number of fan motors of this size used.

In other words, each and every case has to be analyzed separately; the kilowatt-hours you now use and those you would use with purchased power, as well as the demand charge, should all be carefully considered. It might be added here that many companies have made the mistake of assuming that the kilowatt-hours now used will be the same as will be used with purchased power. Actual cases have been known where this consumption was less and other cases where it was 100 per cent. higher. Future conditions and additional load should also be carefully considered.

Now, central-station power is comparatively a new thing for coal mines. Determination of rates and proper composition of contracts, to be fair to each party, has become a specialized branch of the electrical profession as applied to coal-mining work. You have probably read over some power contracts carefully, and when you had finished wondered what it was all about.

I have known of many instances where contracts were signed without an analysis of conditions or due consideration given to the contract proper. Is it surprising, then, that some are dissatisfied? There are many companies that should buy power, and there are others who will still make the mistake of not putting in their own plant.

Another Reason for Difference in Opinion

It may be added that another cause of the difference of opinion relative to the cost of purchased power is the widely different rate (both secondary and primary) of the various power companies. The total bills are rather hard to compare, due to different methods used by power companies of basing the demand charges, while the secondary rates can readily be compared. Curves have been compiled showing the comparison of rates of various power companies, the comparison of primary charge being based on the average results obtained from actual tests.

Points taken at different parts of this curve show the following percentages based on four power companies which have practically the same rate:

SECONDARY CHARGE

	Per Cent.	Per Cent.	Per Cent.	Per Cent.
At 10,000 kw.-hr.	112	101	98	95
At 40,000 kw.-hr.	100	96	68	73
At 500,000 kw.-hr.	128	111	64	81

TOTAL BILLS

	Per Cent.	Per Cent.	Per Cent.	Per Cent.
At 10,000 kw.-hr	112	101	98	95
At 40,000 kw.-hr.	100	96	85	84
At 500,000 kw.-hr.	131	111	102	108

It will be noted that the secondary rate and total bills for small consumptions are fairly uniform. However, there is a wide difference at the consumption of power, which would probably strike the average operation.

If the foregoing, including the rate just mentioned, are self-evident facts relative to this important question to the coal operator, he should not spend thousands of dollars and bind his company in a long-term contract without giving the matter careful consideration.

The marked economies that can, under proper conditions, be obtained with purchased power have been a strong factor in demanding the attention of the operators to efficiency engineering. The selection of the electrical equipment for a new mine is of high importance, and there are many points to consider. The size of the lease, quality and thickness of coal and the output desired are, of course, the important factors in the determination of the amount and size of equipment necessary.

If the development will be distributed over a large area, or if the drift mouth is a considerable distance from the natural location of a power house, the source of direct-current supply must be brought closer to the working places. This can be done by locating a motor-generator or rotary near the drift mouth or inside the mine and converting to direct current from alternating current, which is generated by the coal company's own plant or else purchased from a central station.

Too much emphasis cannot be laid upon the importance of selecting either a generator or converting apparatus of the proper size, speed, etc., to take care of the power requirements of the mine. It is almost as poor engineering to select equipment too large as too small, and the fact that voltage and power are so often confused has led many companies to install apparatus entirely too big for their requirements. A machine too large is an expensive luxury, as the load factor and efficiency are low. Cases are known where a large machine was bought second-hand because it was cheap. In the end it was very expensive, as the additional cost for a machine of the proper size was soon lost in the increased monthly expense of operating the inefficient unit.

Mine loads come at irregular peaks or swings, these peaks extending in most cases over a short period of time. The generator or converting apparatus must, of course, have capacity enough to handle these peaks. To meet these requirements the manufacturers have designed generators and converting apparatus capable of handling large overloads for short intervals.

Average Load Factor Decided From Many Tests

From exhaustive tests on various coal mines in West Virginia and Kentucky, the average load factor was found to be between 25 and 30 per cent. Nine plants of 150-kw. capacity each were tested, which plants showed the following average data:

$$\frac{Horsepower\ installed}{Horsepower\ connected} = 1.72$$

$$\frac{Horsepower\ installed}{Horsepower\ peak} = 2.82$$

Thirteen plants of 200-kw. capacity each showed the following average results:

$$\frac{Horsepower\ installed}{Horsepower\ connected} = 1.60$$

$$\frac{Horsepower\ installed}{Horsepower\ peak} = 3.97$$

The kilowatt-hours per ton of coal mined is naturally variable for different mines, due to the difference in mining conditions, variations in the hardness of coal, length of grades, ventilating, pumping, etc.

Assume a high average of 4.5 kw.-hr. per ton of coal mined, a monthly output of 10,000 tons and a consumption of 45,000 kw.-hr. per month. With a 27.5 per cent. load factor this means a 5-min. peak of 212 kw. A 150-kw. generator or converting equipment, with a 25 per cent. overload for two hours and a momentary overload of 100 per cent. would be amply large to handle all ordinary cases as cited above. In designing the building to house this machine, provision should be made for the ready addition of a second or third unit, should future developments warrant such an increase.

It is evident from this data that it is the heavy peaks or swings that must be prepared for, and right here is where the combination of alternating and direct current in and around the mine often makes the economical and efficient use of power possible; through driving with alternating current such apparatus as would inherently cause high peaks, on the converting apparatus. In connection with a power contract, however, signed on the connected-load method the above procedure may or may not be advisable, due to the increase of primary charge.

I have in mind one coal company that has two 150-kw. motor-generator sets installed. The hoist and all tipple motors are operated on direct current and the kilowatt demand, as shown by a curve-drawing meter, is 210. The all-month efficiency of the motor-generator sets varies from 45 to 55 per cent. This would indicate that the sets are not carrying continuously anything like their rated capacity, but the two must be maintained simply to take care of the peak loads. By a rearrangement of apparatus one set could be dispensed with and the all-month efficiency of the other set increased approximately 20 per cent. Now, assuming that this company requires 33,000 kw.-hr. a month on the direct-current side to run the mine, that that power costs one cent per kw.-hr., a 20 per cent. increase in efficiency means a saving of $160 per month or $1920 a year. Capitalized at 6 per cent. this means interest on an investment of $32,000. This is an extreme, but not an exaggerated case.

There are many differences of opinion with reference to the relative merits of rotary converters and motor-generator sets, and in every case a decision should be based on the conditions affecting operation. Briefly, a rotary converter is a much more efficient machine and in general will stand greater overloads without serious commutation troubles. On the other hand, if there is a poor regulation in the alternating-current voltage supply, the rotary voltage is influenced more than that of the motor-generator set. To raise or lower the direct-current voltage, or to compound it quickly, the motor-generator set has the advantage. If it is desired to use the set for the power factor corrections, the synchronous motor has its advantage. Thus when the duty and conditions to be met are known, the choice is a matter of selecting that apparatus which will give the most satisfactory and economical results.

How To Select the Motor

In selecting motors for hoists, tipples, fans, etc., it is essential that both the starting and running conditions be known; and in the case of a hoist, the cycle of operation is often essential. If an induction motor has a high starting-torque duty and low running-torque duty, it is expensive to put in a squirrel-cage motor of a large enough size to start the load. To do this means poor power factor, lessened efficiency and as a consequence loss of power. In such a case a wound-rotor induction motor should be selected.

In many mines pumping is an important item, requiring large power consumption. Where alternating-current central-station power is available, the problem should be investigated to determine if a saving can be effected by doing the pumping with alternating-current motors. I know of one case where the cost of power was reduced 30 per cent. by putting alternating current motors on the pumps.

The question of the best method of bonding can never be settled once and for all. New methods are being tried, and the present high price of copper makes attractive the elimination of copper bonds by the electric welding of the fishplates to the rails. In fact there are many companies that could have their track welded from the salvage value of the copper scrap secured from their present return, and in so doing would eliminate future bonding maintenance charges.

In the installation of feeder circuits for mining machines, fans, trolley, etc., it is a common error to keep

each circuit separate and independent of the others, and no advantage is taken of the diversity factor of the minimum load and the maximum return from the investment in copper is not utilized.

The question of feeding the gatherer and hauler of mine cars with hay or "canned juice" is one that is demanding the attention of the wideawake operator. He knows from experience all about the "hay burner," but when it comes to feeding an inanimate object with an in isible substance, he has stepped out of his realm; and many operators again find themselves in a different phase of the electrical field.

The limits of this article do not permit a discussion of the many considerations calling for investigation relative to the storage-battery locomotive. Suffice it to say, however, that although this type of equipment is comparatively new, the field of development is unlimited. At the present time, however, caution and exact analysis of conditions are advisable. Wherever possible the cycle of operation of the locomotive should be known, methods of charging should be carefully considered, and it should be borne in mind that where power is purchased one method of charging may cost 100 per cent. more than another.

The successful single-phase alternating-current locomotive for coal mines, with its elimination of substations and converting apparatus, or to go even further the wireless transmission of energy, the possibilities of a gigantic central station located in the coal fields to transmit power to Chicago, instead of shipping coal there, are not altogether idle dreams, and the conclusions one is forced to draw are that coal operators cannot afford to ignore the trend of the times.

Coal-mining electrical engineering is a highly specialized subject in which the engineer should know mining conditions, the problems of the operators, and should give the subject undivided attention. Further, he should not connect himself to any other pursuit that will not enable him to always give unprejudiced and unbiased opinions. In other words, his recommendations should be based in full sympathy with his client's conditions, financially and otherwise. That the operators are realizing the great advantage of employing engineers regularly is conclusively proved by the large number who, in the last year or two, have retained the services of engineers to act in a consulting capacity and to make regular inspections and reports on their mines.

Five Features in Mine Workings

It is of interest to notice on the accompanying map the following five features, which are of importance in the working of a mine:

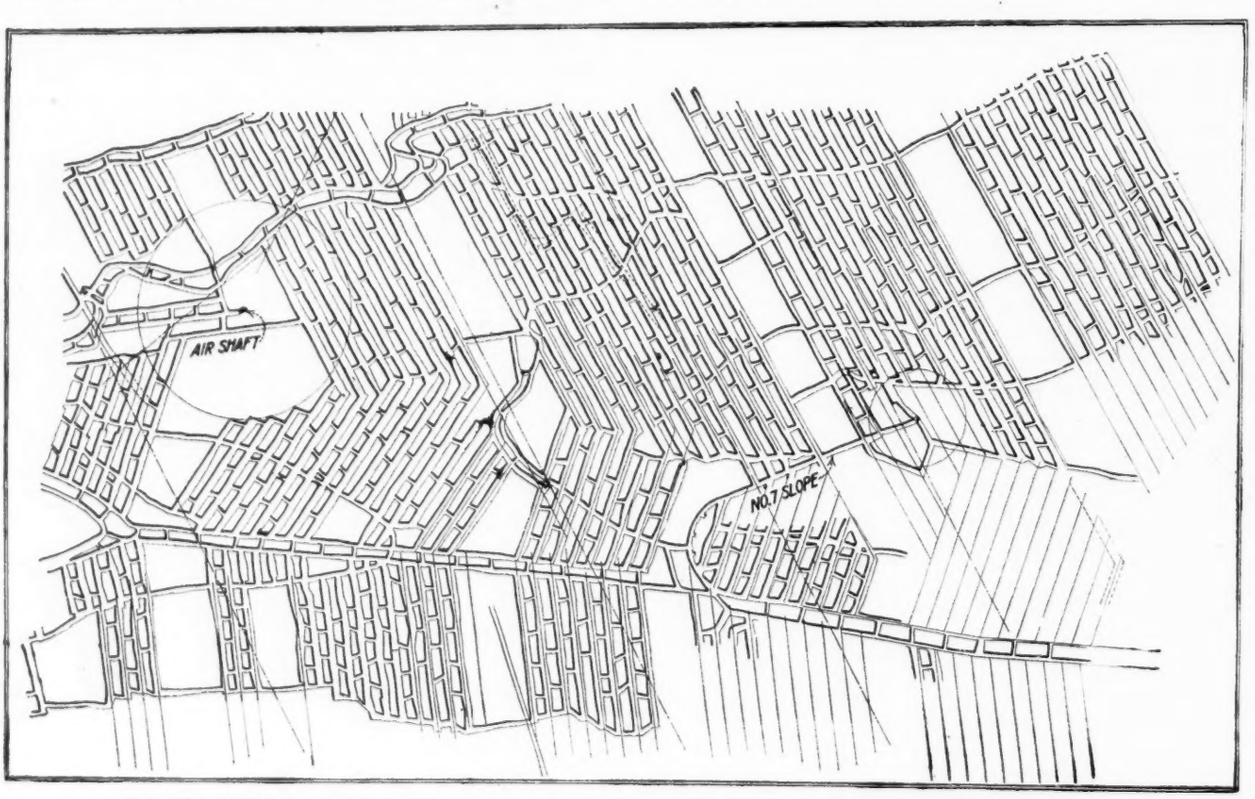
1. The large shaft pillars that are used to protect the shaft from any movement of the rock.

2. The large pillars that are left about every 11 rooms. These pillars are 150 ft. thick and prevent any squeeze that comes on the mine from spreading beyond the pillars.

3. The future direction of every room is planned, and the rooms are driven according to these plans.

4. The regularity in the size of the pillars left between rooms. There is no "hogging," as is seen in so many mines. The idea is not to get some cheap coal now, but to get all the coal.

5. This map shows very prominently the contours of the coal and also the top of the anticline. The contours are shown by the turns of the headings, which are driven almost level. The anticline is shown by the way the rooms head into one another.



ILLUSTRATING FIVE FEATURES THAT ARE OF IMPORTANCE IN THE WORKING OF A MINE

Block Signal System for Coal Mines

By FRANK HUSKINSON
Leadville, Colorado

SYNOPSIS—*Most block signal systems at present in use are manually operated. These are successful as long as the motorman does not forget to throw the switch. An automatic signal system such as here described, which does not depend on manual operation, has many advantages.*

ONE of the most important applications of electricity in coal mining is the signaling system. Of these a number of different types are in use today. The advantages and disadvantages of the different types have been matters of discussion among mine superintendents and electricians for some time. Almost all block signal systems in use today are operated by the motorman or switchman throwing in or out an electric switch that controls a set of electric lights at the various stations. Almost all block signal systems are reliable as long as the motormen attend to the proper throwing of the switches.

A reliable, safe, self-regulating and self-resetting automatic block signal system has long been one of the needs of all coal mines that employ electric locomotives for haulage. Below I give a description and details of a safe system, which is the only one of its kind that I know of. This is an automatic block signal system that has proved absolutely reliable, and in which the only requirements are that the trolley wheel be on the wire and the current turned on to insure operation.

In Fig. 1 is shown a complete connection diagram of the two block stations. As many signal lights and signs as are needed may be connected from the line marked "Power Line" and the return or ground. These signal lights and signs are generally located at convenient places in the mine. The blocks themselves are usually placed at some point out of the way of all meddlers and persons that have no business with them.

Outside Station May Be Placed in Electric Shop

The electric shop is the most convenient place in which to locate the outside station, while a good, safe place can easily be made for the station inside the mine. The details of the arrangement that is used on the trolley lines for the operation of the blocks is shown in Fig. 2. It consists of a hardwood strip about 4 ft. long fitted with two pieces of angle iron, so arranged that as the trolley wheel comes in contact with the angle piece it will make a connection between the trolley wire and the angle iron as long as the trolley wheel is passing along the section. This allows the trolley-line current to flow through any lines that may be connected to the angle-iron piece as long as the wheel is passing over it.

In Fig. 3 is shown a detail of the solenoids and levers that operate the arms *Z*, Fig. 1. The solenoids are wound to suit the voltage and other conditions. However, there must be enough turns of wire on the solenoids to make them strong magnets, so as to produce a quick action on the plunger, which in turn operates the levers that move the arms. The capscrew is for adjusting the air space between the plunger and the magnet.

Fig. 4 is a detail of the lever, showing the catch arrangement on the end. In Fig. 5 is shown a detail of the relays, the windings on which, as will be noticed in Fig. 1, are in series with a lamp. This lamp is a 32 cp., 120-watt carbon globe. Of course, the size of the lamp or the number of lamps that are used in series with the relays will determine the size and amount of wire that will be required to make the relays strong enough to hold the lever marked *B*, in Fig. 5. The relays should have enough wire and be so arranged as to insure quick action on the lever *B*.

In Fig. 6 is shown a detail of the contact segments. The dimensions, etc., given in the diagram can be varied to suit the requirements of the rest of the block signal. Fig. 7 shows a detail of the arms *Z*, in Fig. 1. These arms are hardwood strips of suitable size with the four contacts arranged as shown at *A*, Fig. 7.

Working Parts of the Block Signal System

Fig. 8 shows the star wheel. This wheel is adjusted and fastened to the arm *Z* and can be made out of fiber or iron and the dimensions made to correspond with the rest of the block signal. In Fig. 9 is shown a detail or a signal box. As many of these boxes or lights as are wanted can be wired off the line marked "Power Line" in Fig. 1, and the return.

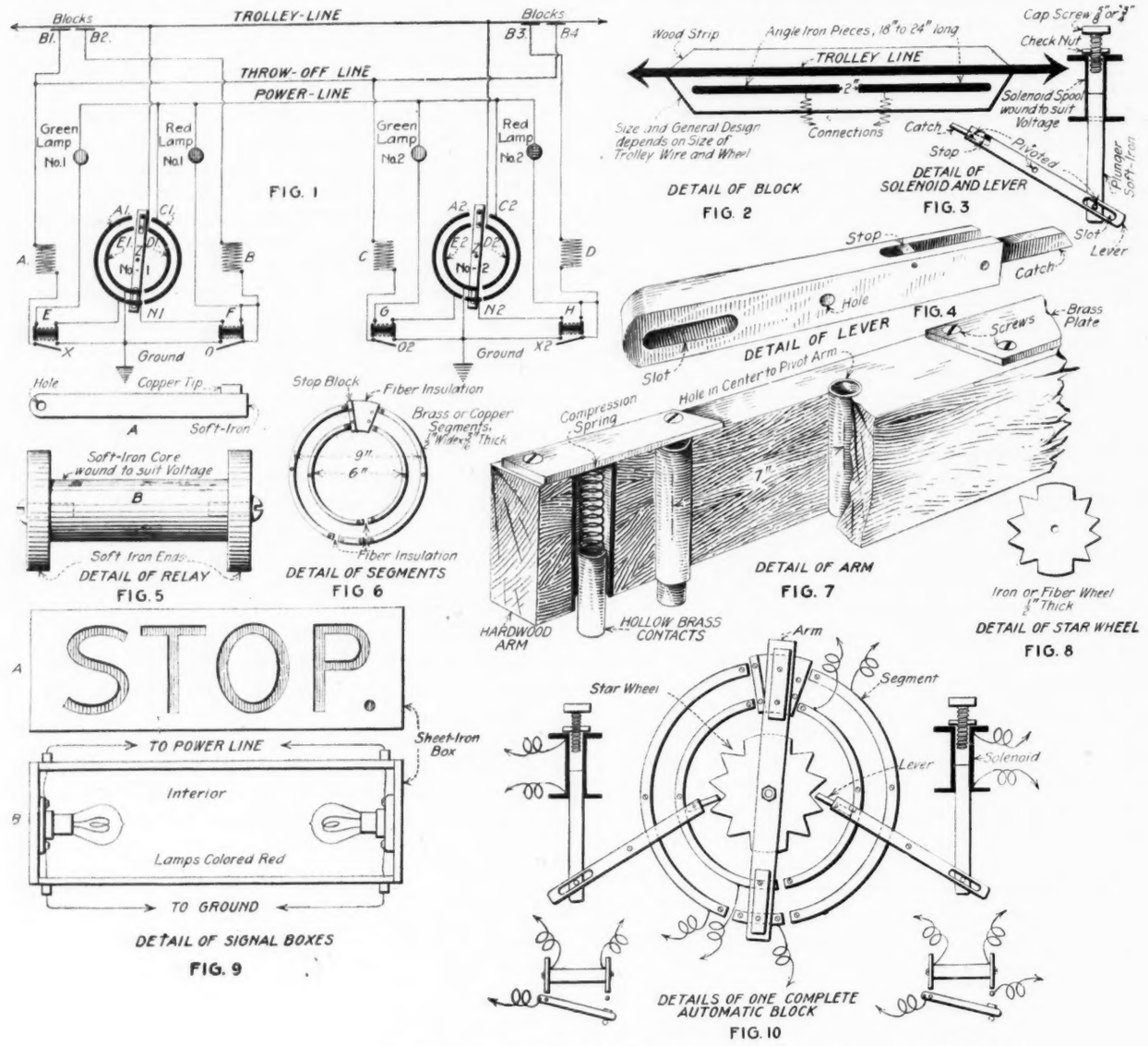
Fig. 10 shows in detail a complete automatic block assembled. The arm is shown in the neutral position. A careful study of Fig. 10 will give a clear idea of the working parts of this block signal, while a careful study of the diagram, Fig. 1, and the detailed description here given will convey a good idea of the operation of this automatic block signal system.

The operation of this automatic block signal system is as follows: The arms *Z*, both being in the neutral position and the locomotive going into the mine, the trolley wheel closes the circuit for an instant at *B*1, allowing the trolley line current to flow to the solenoid *A* and thence to the contact *X* on the relay *E*. But the circuit is open here, so that there is no operation of the signal when the circuit is closed on *B*1. The trolley wheel now passes from *B*1 to *B*2.

As soon as the wheel closes the circuit at *B*2, the current travels to the solenoid *B*, then to the relay *F*, then to the contact *N*1, through the arm *Z* on No. 1, to the contact *E*1, and to the ground. This completes the circuit, causing the lever on the relay *F* to rise and close the circuit at *O*. This allows the solenoid *B* to receive the trolley line current passing direct through its windings to ground. Thus the solenoid *B* operates the levers that move the arm *Z*. This causes the arm *Z* to open the circuit on contacts *N*1 and *E*1, and close the contacts *A*1 and *E*1 simultaneously. It also closes contacts *C*1 and *D*1 together. This causes

the trolley line current to flow from the contact *B*1 to the contact *C*1 through the arm *Z* on No. 1, thence to the power line, to the green lamp No. 1, to the relay *E*, to the contact *A*1, to the contact *E*1, and thence to the ground, causing the green lamp No. 1 to light up and the relay *E* to close the lever at *X*, thereby connecting one side of the solenoid *A* to the ground. The same current also traverses the power line to the red lamp No. 2, to the relay *H*, to the contact *N*2, through the arm *Z* on No. 2, to the ground, causing the red lamp No. 2 to light up and the relay *H* to close the lever at *X*2, thereby connecting one side of solenoid *D* to the ground. Any lamps and signal boxes that are connected to the power line and the ground will thus light up and stay lit until the block is again moved. This is the operation of the signals as the locomotive goes in.

When the locomotive comes to the inside block the operation is as follows: The trolley wheel closes the circuit between the trolley line and *B*3. This allows the current to travel to the solenoid *D*, to the relay *H*, to the contact *X*2, and thence to the ground. This causes the solenoid *D* to operate the arm *Z* on No. 2 This opens the circuit between the contacts *N*2 and *E*2, and allows the relay *H* to open the circuit at *X*2. The red lamp No. 2 goes out, but a fraction of a second afterward the circuit is closed between the contacts *C*2 and *D*2 by the arm *Z* on No. 2. This allows the trolley-line current to flow from the contact *D*2 to *C*2, thence to the power line, to the green lamp No. 2, to the relay *G*, to the contact *A*2, to the contact *E*2, and thence to the ground, causing the green lamp No. 2 to light up and the relay *G* to close the circuit at *O*2 thereby connecting one side of the solenoid *C* to the ground. This makes no difference at block No. 1, as the current in the power line is the same. But just an instant after the trolley wheel closes the circuit at *B*3, it breaks this circuit and closes the circuit at *B*4. This allows the current to flow to the solenoid *C*, to the relay *G*, to the contact *O*2, and thence to the ground, causing the solenoid *C* to operate, which puts the arm *Z* back on the neutral position at No. 2. This opens the circuit between the contacts *C*2 and *D*2, also between the contacts *N*2 and *E*2. The green lamp No. 2 goes



FIGS. 1 TO 10. DETAILS OF AN AUTOMATIC BLOCK SIGNAL SYSTEM FOR COAL MINES

out, and at the same instant the current flows along the throw-off line to the solenoid *A*, to the relay *E*, to the contact *X*, and to the ground, causing the solenoid *A* to operate. This puts the arm *Z* on No. 1 back to the neutral position, opening the circuit between the contacts *C*1 and *D*1. It also opens the circuit between the contacts *A*1 and *E*1, and closes the circuit between the contacts *E*1 and *N*1. The blocks are now both back on the neutral position the same as before the locomotive started in.

The operation of the blocks with the locomotive going out will be as follows: The trolley wheel closes the circuit between the trolley line and *B*4, allowing the trolley-line current to travel to the solenoid *C* and to the relay *C*. The circuit is open at this point. Simultaneously the current travels the throw-off line to the solenoid *A* and to the relay *E*. The circuit is open at this point, so that on *B*4 there is no operation of the blocks, the same as on *B*1 coming in there was no operation. An instant later the trolley wheel leaves *B*4 and connects *B*3 with the trolley line. This allows the current to travel to the solenoid *D*, to the relay *H*, to *N*2, to *E*2, and thence to the ground. This causes the solenoid *D* to operate the arm *Z* on No. 2, thereby opening the circuit between *E*2 and *N*2 and closing the circuit between *C*2 and *D*2. This also closes the circuit between *A*2 and *E*2, allowing the current to travel from *D*2 to *C*2, then to the power line, to the green lamp No. 2, to the relay *G*, to the contact *A*2, to *E*2, and thence to the ground. This causes the green lamp No. 2 to light up. The relay *G* closes the circuit at the contact *O*2, thereby connecting one side of the solenoid *C* to the ground. At the same instant the current traverses the power line to the red lamp No. 1, to the relay *F*, to contact *N*1, to *E*1, and thence to the ground, causing the red lamp No. 1 to light up and the relay *F* to close the circuit at the contact *O*, thereby connecting one side of the solenoid *B* to the ground.

Further Operating Details of System

When the locomotive comes out the trolley wheel closes the circuit at *B*2, so that the current flows to the solenoid *B*, to the relay *F*, to the contact *O* and to the ground. This causes the solenoid *B* to operate the arm *Z* on No. 1. This opens the circuit between the contacts *N*1 and *E*1; the red lamp No. 1 goes out and the circuit is closed between *C*1 and *D*1. It is also closed between *A*1 and *E*1. This allows the current to flow from *D*1 to *C*1, to the green lamp No. 1, to the relay *E*, to the contact *A*1, to the contact *E*1, and thence to the ground. This causes the green lamp No. 1 to light up.

The relay *E* also closes the circuit at *X*, thereby connecting one side of *A* to the ground. No change takes place on No. 2, as the current in the power line is unchanged. An instant after the circuit is made between the trolley line and *B*2, the trolley wheel leaves *B*2 and closes the circuit between the trolley line and *B*1. This allows the current to flow to the solenoid *A*, to the relay *E*, and to the ground, causing the solenoid *A* to operate the arm *Z* on No. 1, bringing it back to the neutral position. This opens the circuit between *C*1 and *D*1, and also between *A*1 and *E*1, and closes the circuit between *E*1 and *N*1. At the same instant the current travels to the throw-off line, to the solenoid *C*, to the relay *G*, to the contact *O*2, and to the ground, causing the solenoid *C* to operate the arm *Z* on No. 2, throwing it back to the neutral position. This opens the circuit between *C*2 and *D*2 and also between *A*2 and *E*2. It closes the circuit between *E*2 and *N*2. This brings the blocks both back to the neutral position and ready to repeat the same action over again.

Minecdotes

The Air Car

In former years pranks were perpetrated frequently upon the new recruit who was being initiated into the odds and ends incident to mine work. Sometimes the greenhorn proved himself master of the situation. I remember one case in particular, several years ago, where this proved to be the case. A new driver, on his second or third day in the mine, came to the sidetrack one afternoon empty handed, with the announcement that he couldn't get any coal that trip, the men on the heading and air-course having gone home on account of smoke. Now, the driver boss, though he was quite a hustler, was also a bully, and when he thought he knew his man he would ridicule, terrify and abuse him unmercifully. In those days drivers were plentiful and jobs were not.

"You homesick-looking jay. You red-brush farmer. You simple rube. What did you mean by letting those men go home? I've a good mind to send you home, too. Why didn't you get the air car for them?"

"The—air—car?" stammered the culprit.

"Yes—the air car! Don't you know what an air car is?"

The new driver confessed that there were a lot of things he didn't know anything about—one of them being an air car.

"Well, if you are going to drive here, you want to wake up and get wise. Now, you burn her to the outside and get the air car. Bring it in on the motor trip. Don't you ever let anybody go home again for the want of air."

The man ran all the way to the outside and, of course, received the "horse laugh" when his errand became known. When he got back to the sidetrack his humiliation was further witnessed. He, too, might have enjoyed the joke had he not been so conscious of the driver boss' far-stretched sense of humor in "rubbing it in"; but his silence was ominous, and the driver boss began to feel uneasy.

On the outside that evening the recruit was waiting for the driver boss. He said simply: "I want you to show me what an air car is."

"Why, you simple fool," the driver boss said with a weak show of his former bravado, "don't you know that there ain't no such thing as an air car?"

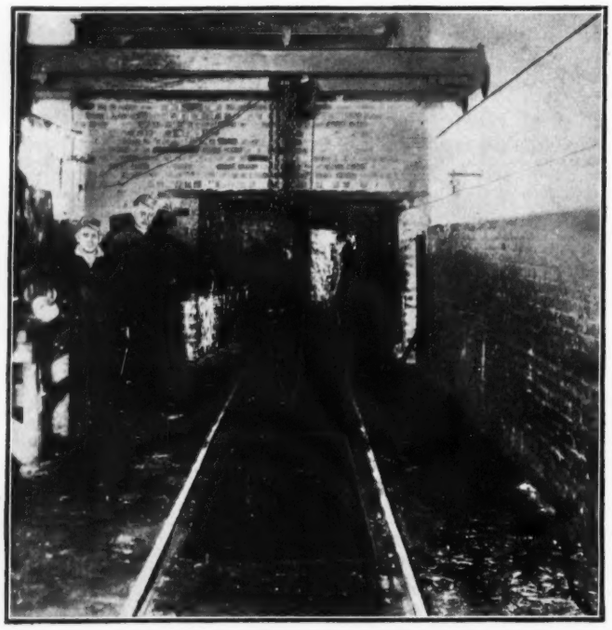
The driver threw off his coat. "Pardner, I may be foolish on this air-car business, but I'm going to find out if I'm the only fool here."

They didn't fight, because the driver boss, after sizing his man up, acknowledged that for once, he, himself, was a fool, too.

Repairing Locomotives Underground

At one of the large mines of the Northwestern Mining and Exchange Co., in Clearfield County, Pennsylvania, is a rather interesting underground motor room in which all repairs are made to the haulage locomotives. The small gathering locomotives are sent to the surface to undergo repair work; but the large ones, which cannot be run onto the cage and hoisted to the surface, are repaired in the mine when that is possible.

The motor room is about 15 to 16 ft. wide. The walls are of brick and the roof of steel I-beams. A



AN UNDERGROUND MOTOR ROOM

track runs through the room at one side, as is shown in the accompanying illustration. A large pit permits the mechanics to work under a locomotive. At the left of the room can be seen the work bench, which is equipped with all the various vises and tools needed for repair work. The crane in the foreground can handle a weight of 15 tons. It is operated by hand and can travel the full length of the room. Electric lights furnish sufficient illumination for the machinist and his helper.

Use of Hot Liquid Pitch in the Making of Briquettes

A plant for making briquettes with the aid of hot liquid pitch which is to be delivered by rail direct from the tar works is being erected at the Hohenzollern Colliery, near Beuthen, in Upper Silesia. The novelty consists in the use of liquid pitch transported in special tank wagons by railway. This was first tried in August, 1914, in the Essen district, when ordinary boiler tanks of 15 tons capacity were used. The tanks had only three miles to travel by road, but with charging and discharging the operations took seven hours; yet there was a saving in material and cost.

The State Railway line is to be utilized for the plant now being completed in Silesia. The process adopted is the Fohr-Kleinschmidt, which, worked on the old plan, was a little more economical than other processes, but promises a considerably increased economy when starting with liquid pitch on the new plan. It might be thought that liquid pitch and powdered or disintegrated coal might be run directly together in briquetting, but such attempts only yield a lumpy product devoid of strength.

By the Fohr-Kleinschmidt process the cold pitch as supplied, without fine disintegration, is heated first to 100 deg. C., the thick fluid being then transferred to a melting drum kept at a temperature of 130 to 170 deg., from which the thin liquid flows into a receptacle to be further heated and sprayed by means of steam or compressed air. The sprayed particles congeal in a mixing drum while still floating in the air; in this condition the pitch, forming a sooty dust, meets the finely disintegrated coal and is mixed with it in slowly revolving drums, fitted with stirring and lifting devices, being pressed into briquettes at temperatures ranging from 50 to 80 deg. C.

The Engelsburg Colliery of the Verein fur Bergbau and Stahlindustrie at Bochum has eight presses at work, yielding some 600 or 700 tons of briquettes daily. The pitch consumption has been reduced 1 per cent. by the adoption of the Fohr-Kleinschmidt process, and the hot pitch is to make a further reduction in cost possible. There will be less waste, no need for disintegrating and remelting the pitch, and several operations will be much simplified; the disintegration affected the eyes of the men in charge, and this will now be eliminated. The emptying of the tanks by compressed air takes 15 min. The pitch to be used in the new plant in Silesia is distilled at a temperature of 250 deg. C.

Hungarian Editor Opens Co-operative Mine in West Virginia

About two months ago Martin Himler, the editor of the Hungarian miners' journal, *Magyar Bányaslap*, organized a company on a coöperative basis. About 85 per cent. of the stockholders are Hungarian miners, belonging to every district where men of that nationality are now working.

Mr. Himler intends that this camp shall be a model operation and he hopes to make a careful study of the reasons that cause the Hungarian miners to wander round from mine to mine. When the experiments are ended he expects to be able to make practical suggestions to other operators who are employing Hungarian labor as to the manner in which Hungarians may be made more steady.

Half the earnings will be distributed to the stockholders in the form of dividends and the other half among the miners in proportion to their earnings. The mine is located at Ajax, W. Va., 18 miles east of Williamson.

PICKING TABLES on which coal is cleaned should have a travel of not over 50 ft. per minute and should be of sufficient width so that the coal will spread out thin enough that lumps of coal will not be covered by others.

Engineer Regiment for France

There is now being recruited at Camp Meade, Md., a special engineer regiment for quarry work in France. This organization is known as the 28th Engineers, National Army, and its purpose is to operate the existing quarries and to open and operate such new quarries as may be needed in France to supply the crushed stone for the building of the highway systems, for railroad ballast, for concrete, and such uses.

Already two complete companies of 250 men have been recruited and equipped for service abroad. On the roster are the names of expert quarrymen, rock and churn-drill runners, blasters and powdermen, crushermen, stationary steam engineers, locomotive engineers, steam shovel men and cranemen, clamshell bucket men, blacksmiths, machinists, electricians, compressor men, trackmen, cooks, master mechanics, quarry superintendents, foremen, and railroad brakemen and switchmen from every state in the Union.

Each company will have a complete quarry equipment of steam shovels, standard gage engines and dump-cars, well drills, tripod drills, hammer drills, jaw and gyratory crushers, screens, belt conveyors, etc., necessary to produce a minimum output of 1000 tons of crushed rock per day. This equipment has already been ordered and has been shipped to the point of embarkation.

All men who volunteer for this service will be enlisted as privates, but those who show themselves qualified will be raised to the grade of noncommissioned officers. Any specially qualified man who is beyond the present draft age may enlist by showing proper qualifications and passing the requisite physical examination.

The officers of this regiment are all professionai engineers who have done quarry and heavy rockwork in all parts of the United States and are graduates of the officers' training camps.

The 28th Engineers offers an exceptional opportunity for the quarrymen of this country to show their skill and courage, as the success of the American Army operation in France is dependent upon the roads and railroads, which in turn are largely dependent upon the supply of crushed stone.

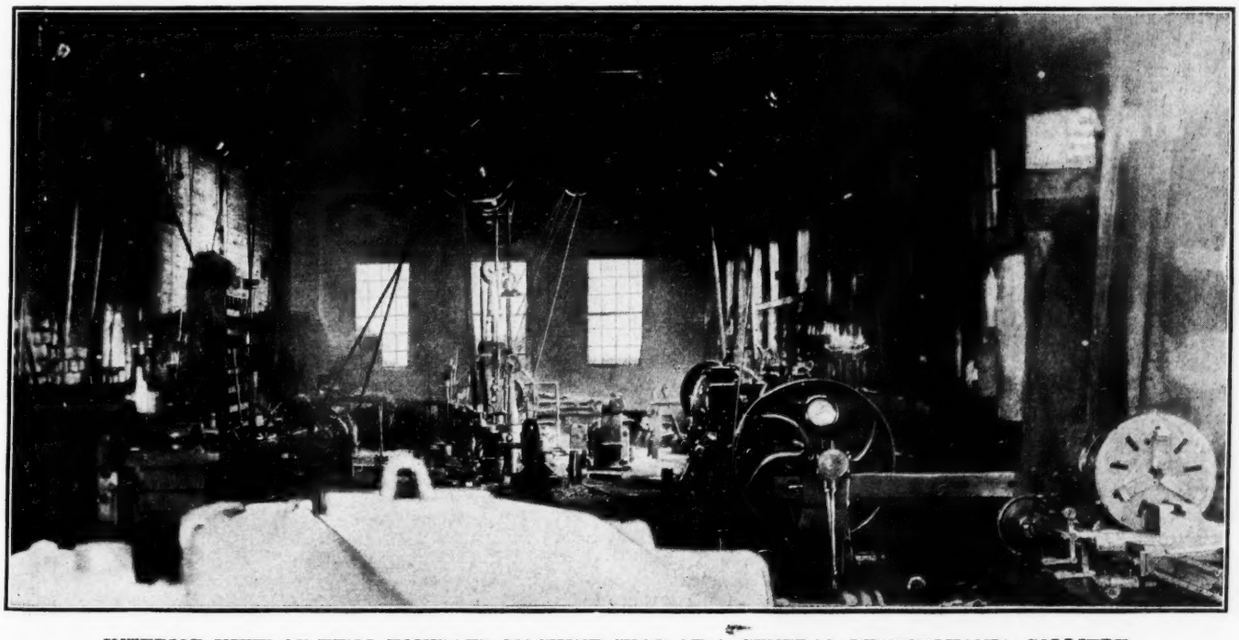
Any inquiries regarding service in this regiment will be answered on writing to the Commanding Officer, 28th Engineers, N. A., Camp Meade, Maryland.

Foundry and Machine Shop at a Central Pennsylvania Coal Mine

At one of the mines owned by a large coal operator in central Pennsylvania there is installed a large machine shop and, what is an unusual feature around a mine, a foundry. The machine shop is well equipped, containing the following machinery: A thread-cutting machine; a radial post drill; a pipe machine; a portable hand-power crane; one lathe 18 in. by 9 ft.; one 24-in. planer; an hydraulic press; one lathe, 34-in. swing, 18 ft. long; a test gage for steam; two small lathes; a blacksmith forge; a centering machine; a power emery wheel, and a power hacksaw. All of these tools are driven by belt drive from a mainshaft which extends down the center of the shop. The power is furnished by a simple 10 x 18-in. slide-valve engine. Fourteen men are employed. (View of shop is given below.)

Immediately adjacent to the machine shop is a small motor repair shop in which the gathering motors are taken care of. On the opposite side of the machine shop the blacksmith shop is located.

The foundry is a short distance away from the machine shop, and is equipped with a 6-ton cupola furnace. All the iron castings used at this and two other mines owned by the same company are made here, as are also most of the brass castings. The largest casting ever turned out by the foundry weighed 1600 lb. At present the iron is handled from the cupola to the molds by hand ladles, but the company intends to install a small hand-power traveling crane in the near future. Three men are employed in the foundry—a founder and two apprentices.



INTERIOR VIEW OF WELL-EQUIPPED MACHINE SHOP AT A CENTRAL PENNSYLVANIA COLLIERY

[Men of the coal industry who find it necessary to get to the national capital on business these days are invited to avail themselves of the facilities afforded by the Washington Bureau of "Coal Age," which is centrally located in the Metropolitan Bank Building. The bureau is in charge of Paul Wooton, who is in a position to be of material assistance to those who have business to transact with Government officials. Have your mail addressed care of "Coal Age," Room 703, Metropolitan Bank Building, Washington, D. C., while at the capital.—Editor.]

Lovett Attributes Rail Congestion to "Tag System" of Army and Navy

In a statement issued by Judge Robert S. Lovett, Director of priority, on Jan. 5, the "tag system" of Army and Navy officials was blamed for much of the freight congestion. The public, he said, had been misinformed by statements that priority orders, issued by him and since suspended by Director General McAdoo, had caused the railroad tie-up. Judge Lovett's order is as follows:

It is being reiterated before committees and in various reports, and repeated from day to day in newspapers, that the present congestion in railroad transportation is due in large measure to numerous and unwise "priority orders," and it is well known and is generally published that I am in charge of priorities. The obvious inference, therefore, is that such ill-advised priority orders were issued by me. Nothing could be further from the truth.

No one knows better than I have known all along that reckless and indiscriminate issue of priority orders would add enormously to the transportation difficulties, and that the greatest caution should be observed in issuing such orders. The result is that since my appointment by the President, in August last, I have issued but five orders awarding priority in transportation, to wit: Order No. 1, issued Aug. 20, directing the movement of coal to the Northwestern States via the Lakes; Order No. 2, issued Oct. 27, restricting the use of open-top cars; Order No. 3, issued Nov. 2, giving preference to certain coal shipments from Utah and Wyoming mines; Order No. 4, issued Nov. 29, according priority in the shipment of certain cattle foodstuffs to the drought-stricken sections of Texas and New Mexico; and Order No. 5, issued Dec. 7, according priority to perishable freight, foodstuffs and certain military supplies, and to coal, coke and certain war materials.

No railroad man or other person with knowledge of the facts has claimed or will claim that any of these orders has caused congestion or seriously hampered transportation.

The fact is that the so-called priority orders, which are more or less responsible for traffic congestion and of which complaint is made, are the result of an arrangement made by the railroads themselves and the supply departments of the Army, Navy and Shipping Board, with which I had nothing whatever to do. That arrangement was embodied in Bulletin No. 22, issued by the so-called "Railroad War Board" in July last, and is commonly referred to as the "tag" system. It prescribed a form of placard or tag which when tacked on a car entitled that car without further orders or instructions to preferred movement to destination. Large quantities of these placards were printed and distributed throughout the United States in the hands of quartermasters, agents, contractors and others getting material for the Government, and naturally one was tacked to every shipment made, whether urgent or not.

Consequently, everything bought was rushed to destination, with the inevitable result that terminals were crowded with materials before they were needed or could be unloaded. No complaint of this system was made or reported to me until late in November, and priority Order No. 5, issued by me Dec. 7, made provision for restricting and regulating the evil.

However indifferent one may be personally to misrepresentation, yet, where the performance of public duty is involved, the facts as they are ought to be stated. Of course, I know the misrepresentation was not intentional, and the unusual circumstances were such as to make it almost unavoidable.

Weekly Production Statistics

Bituminous coal production during 1917 was 544,142,000 tons, according to an estimate made by C. E. Lesher, the geologist of the United States Geological Survey, who is in charge of coal statistics. This is an increase of 8.3 per cent. over the 1916 production. December production did much to pull down the year's total. During the closing month of the year, the production was 42,050,000 tons. This is the poorest monthly showing since April.

Despite the extreme cold which prevailed over much of the coal-producing area, a good showing was made in the five working days of Christmas week, when the mines of the country produced 8,964,000 tons. Coke production during the same week was 538,276 tons. There was a decided decrease in the number of cars of anthracite coal forwarded. During the week ended Dec. 29 anthracite shipments were 29,228 cars.

Commenting on his figures, showing the limiting factors in coal production for the week ended Dec. 22, Mr. Lesher says:

Reports from almost every district indicate some improvement over the extraordinary depression of the week of Dec. 15. For the country as a whole losses due to all causes amounted to 31.9 per cent. of the full-time capacity, as compared with 42.3 per cent. during the preceding week. Improvement was reported in car supply, losses due to that factor declining from 30.8 to 24.8 per cent. Losses attributed to labor shortage and to mine disability returned to normal.

Recovery was most rapid in Illinois, Indiana and Ohio. In the last-mentioned state losses attributed to car shortage fell from 57.1 to 38.8 per cent. of full-time output. Western

Pennsylvania and the Irwin gas field also reported decided improvement in central Pennsylvania, however, conditions underwent little change. The Junior Philippi, Winding Gulf and Fairmont regions of West Virginia, and the Southern Appalachian district, reported increased losses due to car shortage. From the remaining districts of West Virginia and Kentucky a slight improvement was reported.

The production of Alabama was adversely affected by strikes and labor shortage; losses due to these causes amounted to 9.1 per cent.

The Southwestern region—Missouri, Kansas, Oklahoma, Arkansas—and the Rocky Mountain fields—Montana, Wyoming, Colorado and New Mexico—also reported substantial recovery from the depression of the week before.

Director of Railroads McAdoo Working on Coal Transportation Problem

Among the many pressing problems which confronted Director General of Railroads McAdoo last week, none took precedence over the transportation of coal. Dr. H. A. Garfield, the fuel administrator, conferred frequently with Mr. McAdoo. In fact, he seemed to be the one man who could see Mr. McAdoo whenever he wished. Mr. McAdoo's office was besieged throughout the week by prominent men representing powerful interests, but most of them were disappointed at not being able to secure personal interviews with him.

A schedule for distributing coal is being worked out. Every effort is being made to prevent cross-hauling. Distribution points are being selected from which the state administrators may order it into consumption.

All Priority Orders with Respect to Transportation Suspended

The following statement was issued by Doctor Garfield to clear up what apparently is a very general misunderstanding with regard to priority orders:

"By direction of Director General McAdoo, all priority orders heretofore issued with respect to transportation have been suspended and no further priorities may be claimed thereunder. Future orders for priorities will be issued in emergencies under Mr. McAdoo's direction as occasion may require."

National Coal Association Blames Railroads for Coal Shortage

All blame for the coal situation is laid at the door of the railroads by the National Coal Association. In a formal announcement the National Association says in part:

"There need not have been a fuel famine in 1917; there need not have been even a coal shortage. That there was a fuel famine, with its attendant suffering, was due solely to inadequate transportation facilities.

"So far as car supply in its effect on operations of mines is concerned, the mine operators feel encouraged by the centralized control of the railroads under Mr. McAdoo. They feel satisfied that sufficient cars will then be supplied to keep the mines running regularly somewhere near capacity. If this is done the producers can keep their men, because the wages now paid are the highest in the history of the industry, and compare favorably with those paid in other lines of industry."

FUEL ADMINISTRATOR GARFIELD has refused to issue priority orders to assure New York City 1500 cars of coal a day. The city's situation is serious.

In Lighter Vein

Some Qualifications!

The recent naming of county fuel administrators in the several counties of the state has been the subject of considerable comment. The Republicans, of course, did not expect many of them to be chosen from the G. O. P. and they got their expectations fulfilled. They did expect, however, that the men appointed would have more or less knowledge of the fuel business. In that, they claim, they have been disappointed in many instances.

They are telling a little story to illustrate the situation.

In a certain county where a fuel administrator was to be named there is an old man whose frank, blunt, good-natured manner is much on the style of Irvin Cobb's "Judge Priest," with whom most readers of current magazine stories are familiar.

Into this old gentleman's office one day came a young man for a confidential chat.

"Uncle John," he began, "I've just been offered the position of fuel administrator for this county by J. Walter Barnes, state administrator, and I want to get your advice about accepting it."

"Accept it, young man, by all means accept it," he said brusquely, "never turn down anything that's handed to you. Do you know anything about the fuel business?"

The young man admitted that he did not.

"Did you ever teach school?" the old man then asked.

"Yes, taught school for two years, some time back."

"Well, then, you are just the man for the place. If you don't know anything about the fuel business and have taught school you will make an ideal fuel administrator!"—*Charleston Mail.*

This Is the Life!

Following are some statistics taken from a coal operator's diary during 1916:

Threatened to be sued	300 times
Have been sued	0 times
Been asked about car supply	300,000 times
Told about car supply	23 times
Did not know about car supply	200,000 times
Lied about car supply	99,977 times
Shipped coal on contract	148,410 tons
Shipped coal on spot orders	15,240 tons
Loss on contract coal	$48,410.23
Profit on spot coal	50,460.48
Net profit	$2,050.25
Contributions to Y. M. C. A., Y. W. C. A., Belgian Relief Fund, Belgian Tobacco Fund, Boy Scouts, Tuberculosis Sanitarium, Church Building Fund (3 times), Destitute Widows (20 times), Destitute Orphans (1 time) and Salvation Army	$424.10
Living expenses for year	1,602.92
Total	$2,027.02
Balance cash on hand	23.23

THE LABOR SITUATION

General Labor Review

Everybody is working as hard as the railroads will let them, and some are working nine hours a day. The mine workers are showing themselves as willing to override contracts in the interest of production as the operators were in the interest of harmony. In the face of the enemy neither unions nor operators know any law but that of patriotism.

The mine workers expect to discuss the nine-hour day at the biennial convention to be held at Indianapolis. It is going to be a warm discussion doubtless, because it is a matter which everyone will see from a different viewpoint; for every man's judgment will be based on local conditions, and these vary markedly from place to place.

Why the Anthracite Miner Counts Twice

It is of importance that the anthracite miners produce a big tonnage, because the anthracite region is a small field far nearer than any other to a certain large population. If that population is not satisfactorily served by the anthracite mines, it must be more generously served than is necessary by the bituminous mines; and as these are more remote, such service will be obtained only with much waste of transportation. Moreover, the capacity for the production of anthracite is quite inadequate and hard coal cannot be satisfactorily replaced by bituminous coal. For this reason, it is necessary to do all possible to promote the production of anthracite.

Those who are so located that they can provide coal with minimum transportation should be asked to work more steadily and more hours than others. The bituminous mine workers for their part should fill the cars they receive as soon as they receive them. They should not shut down in the evening till all the cars supplied are duly loaded. If they have any objection to make, it should be made to the railroad authorities, who should cut down allotments when men have to work overtime to fill cars which other men in the same district could fill without working overtime.

Some Car Allotments Should Be Made Larger

But for the most part there is no hope in the bituminous region that the allotment will exceed what the operating forces can load. On most railroads the allotment will be such that a full day will be far less than eight hours. It is likely that the Government will regulate matters so that those men will be enabled to work the longer hours who mine coking coal and such coal as is transportable to market with minimum effort.

It is probable also that the railroads will be so regulated that miners will be enabled to work at least seven hours whenever the mines run. It is a mistake to put the allotment so low that while the mines run every day they will run each day far below capacity. It is too much to ask men to travel a long distance, put on their dirty clothes and get all begrimed for a few hours' work. A few less working days would be better. The men would have a chance to make use of the time thus afforded them.

Talk Much About Duties, Little About Rights

But it will take some time for things to adjust themselves. Till that time occurs everyone will have to have patience and talk much about their duties and little about their rights. Let every man be severe in his judgment of himself and sparing in his condemnation of the railroads and the Fuel Administration. Everything cannot be done at once; not everything done will be right, certainly not at first. We all have to learn, not least of all the fuel administrators who know little about either coal or transportation and find themselves tackling problems which would baffle even experts. These men have been chosen for their disinterestedness and not for their knowledge of the conditions to be met. If care is taken to keep them informed of the situation, they will probably solve matters in the end with as fair a degree of efficiency as we have a right to expect.

The New Year brought more recognition of the rights of the salaried men which have been so long neglected. Foremen and other monthly men employed by the G. B. Markle Coal Co., whose salaries were not subject to the contracts made by the mine workers, received bonuses ranging from $15 to $100 for the efforts they had made to increase the production.

Reading Strives Mightily To Get Tonnage

The Philadelphia & Reading Coal and Iron Co. showed its determination to make monetary sacrifices to obtain coal when on Dec. 28 its big Bear Run breaker was rendered temporarily idle by the breakage of some of the machinery. The company ordered the 900 men to remain on the job under pay till the repairs were made. As a result 600 tons of coal were run through the breaker after it was repaired.

A few anthracite mines in the Southern field worked on New Year's Day. The Philadelphia & Reading Coal and Iron Co. had six collieries, out of 40, working. Around Hazleton and Wilkes-Barre attempts were made to run, but without success. The weather was so cold that the mine workers' enthusiasm was somewhat dampened. Had the day been pleasanter the sacrifice of New Year's coul have been made with less difficulty.

Does Advance Apply to Differential Also?

In West Virginia the Preston County Coal Operators' Association and the miners of that district have failed to come to an agreement. They are still in controversy as to whether the 15 per cent. advance on yardage and deadwork, provided in the last wage increase, applies to the differential existing between the prices paid for mining wide and narrow work. Not being able to agree they have, by mutual consent, referred the controversy to Dr. Harry A. Garfield, the Federal Fuel Administrator, for arbitration, his decision to be final and binding and retroactive to Nov. 1.

Much tonnage was lost during the holidays by the failure of the Illinois miners to keep their promise to work every day except Christmas and New Year's. In the Central Illinois field, around Springfield, the output on the day after Christmas and the day after New Year's was 30,000 tons less than the daily average. At many mines in this district and in the southern Illinois fields not more than one-third of the men reported on those days for work, and it was two or three days after each holiday before the men were at work in full force.

Miners Make Merry Too Long in Illinois

For the greater part of the year the average daily production in Central Illinois has been 60,000 tons or 1200 carloads. On Dec. 26 the production was only 710 cars and on Jan. 2 it was about the same. The district in which this tonnage reduction occurred extends from Lincoln to Centralia and from Pana to Carlinville. The announcement of the figures comes from the Central Illinois Coal Bureau, which receives reports on one-fourth of the output of the state. There was a similar loss of production in the other districts.

The official report of the recent United Mine Workers' election shows that all the state officials were reëlected. For president, Frank Farrington defeated Frank Hefferly, of Collinsville, by a vote of 28,438 to 24,254. For secretary-treasurer, Walter Nesbit, of Belleville, defeated Edward A. Wieck by 31.365 to 13,991. For vice president Harry Fishwick defeated Dave Stuart by 24,836 to 23,100.

Miner's Best Home Is His Own

The committee appointed by ex-President John P. White, of the United Mine Workers of America, under authority of a resolution adopted by the last international convention to investigate the advisability of establishing a home for superannuated miners and the cost of maintaing it, will report adversely on the project. The committee's report will recommend a pension scheme instead, because under that system the fear of pauperism will be removed.

The committee's opposition to the establishment of a home is based on the grounds that the men of advanced years should be enabled to obtain relief without leaving their families and being separated from their loved ones to become the wards of an institution.

The report will recommend a per capita tax of 25c. a month, to be levied on the 400,000 members of the United Mine Workers during the next five years, and further, the payment after 1923 of a monthly pension of $20 to all miners more than 65 years of age. Miners under 65 years of age who are incapacitated by accident, and have no means of support, will receive a like amount. Under the committee's plan no miner will be eligible until he has been continuously a member of the organization for 10 years and has paid the pension tax for five years.

The committee is composed of William Mitchell, of Iowa; Evan Evans, of Illinois, and John Hutchinson, of Indiana. The investigation of the committee was far-reaching. Visits were made to the Typographical Union's Home at Colorado Springs; Printing Pressmen and Assistants' Home at Rogersville, Tenn., and several homes maintained by fraternal societies and also the homes provided by the Government for old soldiers.

Should Wait for Delayed Cars

Waiting for cars which may not come for hours or may not come at all is trying to the best of men. But today it is a patriotic duty. The soldier has to wait days, even months, for a foe who doesn't come and attack as expected. The miner might well consent to wait a little while for cars which the Government has promised to deliver but cannot get to the mine on schedule time. He *might* wait and before long he *will* wait. Eventually he will be made to realize that it is his duty.

Just now at some mines in Illinois he is unwilling to wait, even though his agreement, made before the war, required him to stay at the mine an hour at starting time if cars were not on hand. The operators at some mines say that men go home if the cars are only a few minutes late. As a result the cars lie idle on the switches until the next day, and a day's output is lost.

Louis Senior, owner of the Branch mine, near Belleville, has filed a complaint with the Belleville District Fuel Commission, comprised of Adolph Knobeloch, Victor Gans and E. A. Daley, declaring that four times within the past six weeks the men employed at his mine have refused to go to work because no cars were on the siding at 7:30 a.m. He declares that the men have signed an agreement specifying that, even though no cars are at hand, they will start working at 7:30 a.m. and continue at work until 8:30 a.m.

He asserts that the men have broken this agreement, even when cars were in sight, and in other cases when the cars were being pushed into the siding. The capacity of the mine is 600 tons a day, and that tonnage is lost every time the mine is laid idle. The commission will ask the Government to define its powers to deal with the case. Other operators say they are having the same experience and the aggregate tonnage lost is large.

Will Work Only Under Flag

Some of the mines in Crawford County, Kansas, are manned by Austrians and others by Italians. The companies have found it desirable to group them by nationalities, as their racial antipathies make frequent troubles. The other day 500 Austrians threw down their tools, and the operating company naturally assumed that the men did it to hamper the United States in the successful conduct of the war.

Fred Robertson, a fuel administrator, was called in to get the men back to work. On securing an interpreter he soon found out the cause of the trouble. Over the mines in which the Italians worked an American flag had been erected, and the distinction had made the Austrians jealous. They wouldn't work without flags on the tipples over which their coal was dumped. A rush order was sent for flags, and at last accounts the flags were flying and the Austrians were trying to put out more coal than the Italians.

To Knit Up Pacific Industry

The delegations to the Indianapolis convention from Washington, Montana and Wyoming propose to seek at that meeting permission to form a tristate organization in order that working agreements between mine workers and operators in those three Northwestern States would run for the same period and have similar provisions. The Monarch mine in the Cle Elum field in District No. 10 has made an agreement with its men covering both the hours of labor and the day and contract rates.

The Pacific Coast Coal Co. and District No. 10 have made an agreement for the men engaged in the briquetting plant of the company at Renton, King County, near Seattle. The agreement provides for an eight-hour day and for a wage increase running from 40c. to $1.27 per day. The press operator, the blacksmith and the machinist will receive $5; the feed operator, $4.50; the press-floor operator, the powdered coal operator, the kettleman, the briquet loader, the box-car loader and the coal unloader, $4.25; the dryer operator's helper, $4, and the laborers, $3.75.

Labor Aids the Red Cross

When it comes to helping a cause in which they believe, no one will "shell out" more readily than the mine worker. The Red Cross workers at Pottsville erected their booths at the collieries and approached the miners when they received their semimonthly pay. As a result 5500 of the coal diggers joined the Red Cross.

But, after all, the palm goes to an Illinois mine. For there is still patriotism of the Abraham Lincoln type in Illinois despite all the true stories of alienism we have to record. The members of local union No. 1055, at Cambria, Williamson County, Illinois, agreed to accept the offer of the Carterville & Big Muddy Coal Co. and to work on New Year's Day, donating their services to the Red Cross. The company agreed to turn over to that organization every cent received for the coal, and the Clear-Clinch Co., which jobbed the coal, promised to give its commissions to the same excellent object.

And for the money thus earned every man, woman and child in Cambria was to receive a membership in the Red Cross. The town was to be made a 100-per-cent. Red Cross town. Whatever remained after the membership was filled was to go to the Williamson County Chapter of the Red Cross, for use in purchasing goods for surgical dressings.

Of Course, There is a Strike

Scanning the whole horizon of the United States coal-mining activities, of course, a strike can always be found. The day before New Year's the men of the Superior Coal Co., a small concern in troublous Michigan, went on strike to compel the company to restore Charles Tonnacliffe, a fireman, to the corporation's working force. John Crutchfield, of Saginaw, the president of the Michigan mine workers, supports Tonnacliffe's claim to work. According to J. E. Evans, the general manager, the mine workers quite generally do not, and have petitioned Crutchfield to allow them to continue work without Tonnacliffe. They are said even to threaten to leave the union if the president of the organization proves obdurate in his support of Tonnacliffe. Work resumed Jan. 4 pending adjustment of difficulties. Michigan miners have a paramount obligation to work steadily. By working they reduce the need for transportation immensely. Though the mines are small, strategically they are of great importance.

EDITORIALS

What "Sufficient Interest" Really Means

THE Annual Report of the Federal Trade Commission tries to clear that board of the crime of having, in the report of June 20, correctly outlined the facts about the anthracite situation. The Federal Trade Commission stands convicted of having told the truth, the whole truth and nothing but the truth. No gainsaying now can turn that truth into a falsehood.

"Whatever measure of success," said the report of June 20, "has marked the efforts of the commission with regard to anthracite coal has been largely because the car supply has been adequate by reason of the close corporate relation between rail transportation and anthracite production. Quite the contrary condition exists with relation to bituminous and rail transportation"—apparently meaning transportation of bituminous coal by rail—"and with relation to water transportation as to both kinds of coal."

Of course, the commission received a call for its unfortunate frankness. Men have been returned to Congress for no less a service than denying this self-evident fact. So in the annual report of the commission, an attempt is made to explain away the first statement, this extraordinary language being used in that ill-adjudged endeavor:

"This statement of the commission seems to have been open to a construction that a close relation between coal-mining companies and transportation agencies is desirable. On the contrary, the commission was seeking simply to show that, if *sufficient interest* is present, transportation facilities in existence can be made adequately to care for stimulated production. The speedy movement of coal by interested transportation companies was pointed out to emphasize by contrast the misuse of rolling stock by other transportation companies.

"The evils of a community of interest between coal-producing and coal-transporting companies are fully recognized by the commission. Directly as to anthracite, this is shown by the abnormal freight rates which have been secured by interested transportation companies for the movement of such coal. Instead of being in the public interest, this community of corporate interest, therefore, makes for unduly high prices of coal to the public and has in it the making of further monopoly."

We have italicized "sufficient interest" because it is the gist of the sentence. What is "sufficient interest" but sufficient profit. There was profit in using coal cars for coal, therefore they were used for that purpose in the anthracite region. The commission lauds sufficient interest at the opening of its statement and laments it at its close.

However, it is a fact that the fullness of car supply in the anthracite region is not due solely to the monopolization of coal cars in coal-transport service. It is a fact that the number of cars in the anthracite region is equal to the needs of the busiest season. That has never been true of the bituminous region. The railroads hauling anthracite have had "sufficient interest"—that is, sufficient profit—not only to keep cars in coal service but to buy and maintain them in condition for that purpose.

They have also had a more even demand for transportation throughout the year. This has made it reasonable to buy cars to supply the peak load with satisfaction. No one can afford to buy equipment to supply a peak load of short duration or uncertain occurrence. It has been by the control that the commission deplores, or pretends to deplore, that the distribution of demand for coal has been secured. The Federal Trade Commission will do well to put the facts before the public without fear of consequences and without sign of hedging.

Given the prospect of profit, men will invest in coal cars. Given the prospect of greater profit in coal transport than in other transport, men will transport coal and let other merchandise rest. Few invest willingly in unprofitable enterprises, the commissioners themselves not excluded. Few do what pays them less when they can do something that will pay them more.

That is just why men have been leaving the mines for the munition factories. The latter paid more for their labor and so commanded their services. It doesn't do to work at an unprofitable trade, because as a rule the rate of pay is a rough measure of the desire of the public for a certain type of service.

There is a class of demagogues who condemn men for seeking a profit, and say no man should be actuated by such mean motives. Suppose some people do operate at a loss, willingly or by compulsion, the same demagogues declare that a large profit is being made, for surely, they add, no one will work at a loss. They convict themselves. They say that everyone ought to do what they also say there is no one who will do. They preach civic virtue and deny that the possession of civic virtue is attainable. Why take so contradictory a course?

"The Very Bulwark of Coal Mining"

SPEAKING at a dinner of the American Institute of Mining Engineers, New York Section, a metal-mining engineer and manager, Arthur Thacher, said: "I can look back on 40 years of mining experience during which I have seen wages of American miners rise from 65c. a day for 12 hours' work to $4 and $6 a day; yet our cost per ton is less now than when we paid 65c. The increased use of machinery does not account for the whole increase in efficiency, because the same kind of shoveling and pickwork is still employed. We are working more intelligently; our men are not complaining of extra work, for the performance of it is made easier by the intelligence used in its performance."

That is an interesting statement, and it is true. Compare it with coal mining, which has faced continuously

increasing costs per ton because of increasing prices of piecework. When the European war commenced the charges for haulage, ventilation, drainage, hoisting, dumping and railroad-car loading in most cases had gone down rather than up. In 1914 most of these operations involved manifold more units of duty than they did years ago, and wages also had risen, but as we were working with intelligence and were doing the work on a day-wage basis, we were meeting, and in some cases, more than meeting, these larger burdens by our greater efficiency.

Nor were the men working any harder than before. In many instances they were hardly working at all. The motorman rarely left his seat. The coupler almost never pushed a car. The dumper merely pulled a lever. The trimmer handled a car dropper instead of barring the railroad cars. The pumper watched a pump; he did not as in years past work the crooked handle of a pitcher pump. Nor was ventilation secured by a hand fan or a furnace, which latter needed the constant attention of the stoker and was good for only a small section of a mine or for a restricted coal working.

And so the daymen worked less and did more, but the piecework price mounted even higher and higher. Some one attacking the proposal to replace piecework by day-work at the mines said in connection with some remarks at the recent meeting of the Coal Mining Institute of America that piecework was "the very bulwark of coal mining," and when he said that he spoke well. It is the bulwark, the trenchwork of coal mining, the defense of the weak and the craven in the industry.

But some day we hope to go "over the top." We are going to cease digging deeper and deeper and are going forward in coal mining. We are going to shelter ourselves no longer behind bulwarks. We propose to establish a new industry, but that will not be done as long as we retain the piecework system.

When the profit of progress goes to the progressive then will progressing be possible. As it is now, what little progress we have in actual mining profits only the man on whom it is thrust; and why thrust progress and profit on anyone who will not even *help* to pay for it?

True, if we put our mines on a piecework basis throughout, replacing what day rates we have by tonnage rates, we might, and probably would, save a large amount of money *at first*. We would speed up our workers, but there is a limit to that speeding. There is a point beyond which the workman, however much speeded, encouraged, dogged or threatened, cannot go. That goal once reached there is no future progress possible. The utmost is then attained; but, given new machinery and new methods, marvelous progress can be made. If, however, the man who works on the piecework basis is to get all the advantages of those helps, methods and machinery, who is going to bestir himself to supply them? Who will stay up nights to imagine and develop them? Who will put money into the coal business to secure them? Who, to make a more correct statement, will deliberately throw money away to have the workman profit by them?

It will be said that a new development will justify a new piecework scale. Those who have tried to get such new scales will please bear witness to their troubles. It is an almost hopeless task to secure such a revised contract. The scales as written do not provide for any revision of rates when conditions are revised.

And besides, the change is not always revolutionary and the need for a new scale is not clearly indicated. But where it is quite revolutionary it may be at first an advance of doubtful merit, as is usual in all progress. Would some one make a scale for flying per mile when the Wrights were first trying out their airplanes at Kitty Hawk? And if a scale had been made, what a damper would have been set on the progress of aviation, provided there was a union capable of preventing that scale from being lowered and strong enough even to raise it biennially, annually and, on occasion, seasonally also!

Paying the Price

AS a nation we have dallied carelessly with the "good roads movement." Now we are paying the price. It is proposed to send trains of loaded army motor trucks, under their own power, from Detroit to the seaboard. The first fleet was eight days in reaching Pittsburgh. Less than one-half this time would have been consumed if there had been even a fairly good road to travel.

Much freight could now be diverted from the railroads to the highways if good ones existed, but our extreme need finds us with only one-tenth of our 2,500,000 miles of public roads available for heavy motor-truck traffic.

The American people will have learned by the time the war is over that there are national prophets in this land whose advice is deadly. Such are those who told us that should war come, the American people would rise overnight, and in their might would smother all enemies. We have been rising since last May and haven't got up on our feet yet. Let us not forget the price we are paying for our credulity.

Danger and Discipline

THE fact that the fatality rate of the coal mines has outstripped the tonnage rate in the past year is a matter for careful thought on the part of both operator and mine worker. There is little question but what greater discipline would result in reducing that fatality rate. The soldiers from Australia, we are told, did not at first take kindly to discipline. They opposed the strictness and precision of militarism till they found that it was badly needed in the presence of danger.

Mines are, in a modified way, like battlefields. They are places of real or potential danger, and discipline is necessary. Where there are unions, there is no reason why it should not be union discipline. In some mines the pit committee strictly prevents crowding around the cage and pushing around the man trip, and other breaches of the mine law. It is proud to act as an instrument of beneficence.

But whatever the condition of the mine—unionized or ununionized—there must be discipline for safety. Discipline after all is coöperation as opposed to self-interest.

The discipline of the mine is different from the discipline of the battlefield as mines are different from battlefields. But discipline there must always be. Let us make up our minds to that before the danger overtakes us.

LEGAL DEPARTMENT

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NON-ENGLISH SPEAKING EMPLOYEES—Within the rule of law that an employer is liable for injury to one employee caused by negligence of another, when the latter had previously shown himself to be so incompetent as to show that the employer was negligent in retaining him, an employee is not to be deemed to be incompetent merely because he is not familiar with the English language. So where a particular accident resulting in injury to one employee is found to have been caused by some negligent act of another not directly dependent upon the inability of the latter to understand English, as where machinery is started while another employee is known to be in a perilous position, the employer is not liable, in the absence of proof that the negligent worker's incompetence was previously known. (New York Court of Appeals' Barber vs. Smeallie, 117 Northeastern Reporter, 611.)

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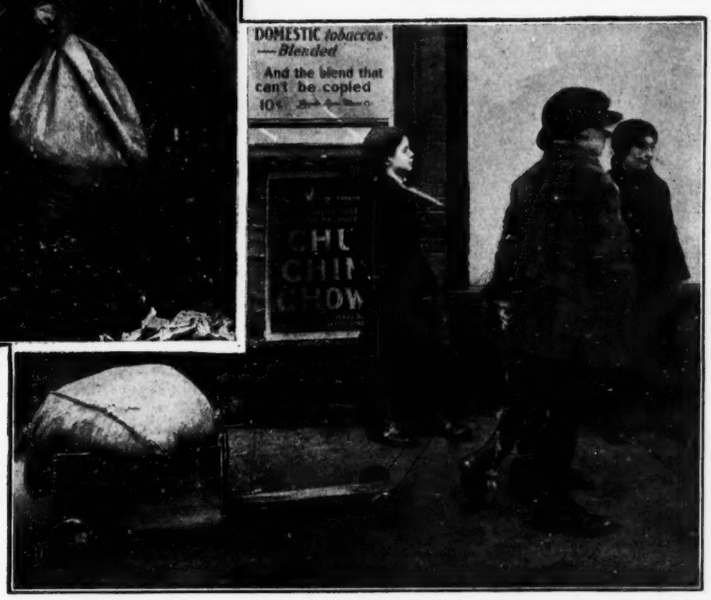

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DISCUSSION BY READERS

Women in Industry

Letter No. 2—I did not see the article referred to by C. McManiman, in his letter discussing the employment of women to fill the places of men who have answered the draft call. In his letter, which appears in *Coal Age*, Dec. 22, p. 1067, Mr. McManiman appears to object to women being employed as slate pickers, loaders, locomotive runners, etc., but thinks they could fill the positions of checkweighers, warehouse keepers and distributors of explosives.

In my opinion present conditions do not demand the employment of women in or about the mines. They are doing excellent work for the Red Cross, the Y. M. C. A. and as members of the War Council. In a few instances, women appear to excel the men in the work they have undertaken to help win the war.

The positions relating to coal mining that women might fill would, I believe, have to be confined merely to clerical work. The actual performance of the duties involved in the positions just mentioned, however, require considerably more than clerical ability. The weighing of coal, for example, at the majority of mines, requires much executive and physical ability.

A warehouse keeper should not only be a conservative person but possessed of a wide mechanical knowledge of the requirements of the entire plant. In regard to a distributor of explosives, I would not think of placing a woman in that position, which requires not only strength to handle the work, but experience along particular lines with which women are not commonly familiar.

A Look Into the Future

While conditions at present do not appear to require that women engage in mining work, it must be acknowledged that such a possibility exists in respect to the future. Before that is done, however, the men remaining at home must be willing to make whatever sacrifices are required, such as temporarily closing nonessential industries, and devoting their energies to the mining of coal and other work on which the success of the war depends.

Suggestions have appeared, from time to time, in regard to what industries are unessential and could be dispensed with, for a time, without loss to the community. I will not attempt to enumerate them. I believe, however, that when the emergency arises, the country will be equal to the tasks before it. The work already done shows a high degree of efficiency in many respects.

Speaking of the need of workers to supply the places of men called to the front, let me suggest that there are a large number of boys under the age of 16. These boys are more fitted than women for all classes of mine work. In fact, it has not been so long since they were permitted to work in and about the mines. At present, the new Federal child-labor law makes it unconstitutional for boys under the age of 16 to be employed in any industry, the product of which is shipped into another state.

Although I worked in the mines when I was 12 years old, I realize that the law to which I have referred was enacted for the protection of the boys and the proper development of the human race. It was a good law and greatly needed. In the present crisis, however, it will not be strange if conditions soon require that this law be set aside, since boys of that age can better be spared than women, and their employment in these positions will not be so detrimental to the human race.

It is my belief and conviction that none of our good laws, designed for the betterment of the people in times of peace, will be allowed to overshadow the patriotic necessity that arises in time of war. When the time comes and the need is present, I believe that the President will permit no red tape to interfere with the immediate adoption of what is required to accomplish the end for which we are all striving. It is hardly necessary to remember, here, that the laws of most coal-producing states forbid the employment of women in the mines.

W. H. Noone.

Thomas, W. Va.

Miners and the War

Letter No. 5—I was greatly interested in reading the letters regarding miners not being as anxious to do their utmost to produce, at this time, the largest possible quantity of coal, which has been urged as a great factor in winning the war.

I must admit that miners, as a class, do not care to be driven like mules, or to be whipped into line any more than workers in other industries. As a class, miners are stubborn but, on the whole, I do not know that this feature of their make-up is any more prominent than the same trait in coal operators. It is this characteristic obstinacy that has frequently widened the gap between employer and employed, in all industries.

Organization of Miners and Its Effect

It must be admitted that the lack of coöperation often manifest between miners and the operators who employ them has led the former to organize for their own protection. If greater efficiency is to be realized in the mining of coal, and the operation of mines, it is clear that both parties must work in harmony. An instance occurred a few mornings ago that illustrates the importance of this fact.

At a certain mine, it happened that morning that the miners' train, which daily carries them to their work, was three minutes behind the appointed time. Taking advantage of this slight delay, the miners, with little thought of coöperation and working in harmony with their employer, refused to go to work and the mine was forced to stand idle that day.

The remark is often made that miners have employed such assertive tactics ever since they were organized. But, while this may be true it is certain that remarks of that kind will not tend to bring the miners and operators together. What is needed is less wilfulness and more kindliness for each other, expressed both in words and acts.

There is ample opportunity and every inducement, at present, for miners to produce the greatest possible output of coal and to work every day that the mine is running. Instead of this, however, we often find the miner indifferent to the present rigid demand for coal. He is prone to regulate his workdays in accordance with his own individual needs, rather than from any feeling of patriotism.

Miners and the Penalty Clause

The average miner regards the "penalty clause," for example, as an attempt to drive him to work. Anyone who has this idea or assumes such an attitude, in the present war crisis, could not have read the excellent Foreword, entitled "Is This My Boy?" which appeared in *Coal Age*, Nov. 24, or thought very much in that direction. As a miner, I am frank to say that I favor the penalty clause, as long as it is used against the right party and in a way that no innocent person will suffer. It is true that at present miners should earn good wages, owing to the increased price of mining. At the same time, there are other conditions that affect the earnings of the miner. Speaking for myself, I feel safe in saying that I never had a less Christmas pay, in the last eight years, than that which I received in my envelope on the 24th of last month.

One has not far to look for the reason for this shortage. It was not my own fault, neither did I find that I had not been credited with every ounce of coal mined. Yet, my pay fell below a 50 per cent. rating. Looking for the cause, I found that I had been obliged to lose three and one-half days, owing to my coal not being cut. Three more days were lost when the mine was not working, probably because there were no flats.

Taking these things into account, I feel that the lack of tonnage in coal production, so generally ascribed to the failure of miners to work regularly in their places, cannot be placed to their charge. This shortage of output should not occur, under present conditions when the country is needing more coal than ever before.

In closing, I want to recommend that less be said about the inefficiency of miners, and a more earnest effort be made to place the blame where it rightly belongs. Let the railroads and the mine managements each assume their share of the blame. When the real source of the trouble is found and understood, there will be more hope of overcoming the difficulty and producing all the coal that the country requires.

W. H. Luxton,
Linton, Ind. Miner.

Shotfiring re Explosion

Letter No. 1—In connection with the claim of John Verner, former state mine inspector in Iowa, that a mine atmosphere laden with powder smoke contains so much carbon dioxide that it is "incapable of promoting or maintaining an explosion" and "will have a decided quenching effect on the flame of an explosion that is already under way," *Coal Age*, Nov. 3, p. 774, kindly allow me to cite an instance bearing on this point.

It became my duty, a short time since (Dec. 10, 1917) to enter a mine at the head of a rescue party, for the purpose of rescuing, if possible, two unfortunate shotlighters who had been caught in an explosion of powder smoke intensified and propagated by dust.

Our party arrived on the scene and entered the mine three hours after the explosion had occurred. Attempts at rescue had been made previous to our reaching the place, but these had proved unsuccessful, owing to the men being quickly overcome by the afterdamp, which the force of the explosion had driven back into the old workings on the right of the main entries. The first rescue party had entered the mine equipped only with their carbide lamps. They had not proceeded a great distance before feeling the effects of the afterdamp and were obliged to return to fresh air. We found them so overcome by the gas as to be unfit for further service.

The explosion had put the fan out of commission and the only means of ventilation remaining was a low stack at the mouth of the return airway. Here a fire was started and maintained, by burning old oil barrels and other wood. Having no helmets or breathing apparatus of any kind and desiring to avoid the experience of the rescuers who had preceded us, we decided to use the Wolf safety lamp, which would enable us to detect either an explosive mixture or blackdamp.

Rescue Work and Conditions Following the Explosion

Thus equipped, we entered the mine and were able to do reasonably quick work, in repairing brattices and hanging curtains at the mouths of those places from which afterdamp was coming. In this manner we proceeded a distance of about 1000 ft. on the main heading and 400 ft. farther on a crossheading turned to the left. At this point, we suddenly came upon the two dead bodies of the shotlighters where it was least expected to find them.

The bodies of the two men showed a few slight bruises, but were practically unburned excepting for a slight singeing of the hair. This work had now consumed 4½ hours, and a few of our party felt a slight sickness but nothing serious. Our good fortune, in this respect, was due to using every precaution.

We adopted the plan of keeping one man from 20 to 40 ft. in advance of the party. The man carried two lamps, one of which he placed on the floor of the entry, and the other he used for testing the condition of the air at the roof. If the bottom lamp burned dimly, we waited for it to brighten or go out.

We hesitated to check our advance sufficiently to seal off the openings on the left entirely, for which there was an insufficient supply of both lumber and canvas. At times, the lamp carried in advance of the party would go out within 15 ft. of them, and it was necessary to replace it with another safety lamp and wait for the air to clear before going farther. In this way, we proceeded from one crosscut to another, until we finally reached the place where the bodies were found.

It was not my fortune to make one of the party who inspected the mine later with a view to determine the cause of the explosion. There was, however, plenty of evidence, which we observed on every hand and which

showed that there had been an effort on the part of the shotlighters to make too high speed in firing the shots. The men worked together, lighting the holes successively, in the same or adjoining places, as rapidly as possible.

My observation has convinced me that the primary cause of this explosion was due to the quick firing of blasts, in places filled with the powder smoke produced by previous shots. Like Gaston Libiez, who writes on this subject, in *Coal Age*, Dec. 15, p. 1030, I am surprised that Mr. Verner should claim that an atmosphere composed of hot air and gases that are largely inflammable will not assist in promoting and maintaining an explosion in a mine.

I hope this matter will be thoroughly discussed in order that we may arrive at a correct understanding, as the long experience of Mr. Verner is worthy of careful consideration.

GAS INSPECTOR.

Worley, Ky.

Illinois and Missouri Coal Fields

Letter No. 1—While I can claim no first-hand knowledge of the Arkansas coal field, yet the inclusion of this field with the Missouri and Iowa fields, as appears in the article of Charles Keyes, *Coal Age*, Nov. 24, p. 886, there seems no reason to doubt. However, I would take vigorous exception to the statement that the western interior province and the eastern interior province were originally one stratigraphic province.

That the Missouri basin was entirely separate from the Illinois basin prior to the deposition of strata to within 25 ft. below No. 2 coal of the Illinois section, there is definite reason for doubting. But, above that level, within the Illinois basin, about 1000 ft. of strata were later deposited, which were entirely separated from and have no connection with the Missouri basin.

LIMITATION OF A POSSIBLE CONNECTING LINK

The possible connection of the Illinois and Missouri basins through southern Calhoun County, Illinois, applies only to strata included in the section extending from about 25 or 30 ft. above No. 2 coal to the same distance below that seam, especially in the occurrence of the clays at the Cheltenham fireclay horizon at Golden Eagle and in the Cheltenham district of St. Louis. The continuity of the Illinois No. 2 coal in Missouri and its identification with one of the Missouri coals, certainly, has not been definitely established, although there seems to be some evidence that the Bevier coal of Missouri is correlated with the Murphysboro or No. 2 coal of Illinois.

The similarity between the Illinois and Missouri sections, and the possibility of the continuity of the measures in these two basins, however, ceases probably a short distance above No. 2 coal and, certainly, before No. 6 coal is reached. The latter seam known as No. 6 coal outcrops in Illinois through eastern Jersey, Greene and Scott Counties, about 30 miles from the Missouri field. There is no evidence to show that it ever continued across the gap, and there is no coal, in the Missouri section that will permit a definite comparison.

The Illinois coal measures, lying above No. 6 or the Herrin coal, lie within the outcrop of this coal around the basin, which makes the possibility of their original connection with strata in the Missouri basin still more remote. There is positively no route by which the shales and limestones of the Missouri section can be traced into Illinois.

In the attempt to correlate the Missouri section with the Illinois section on the basis of lithologic sequence, a most unusual section was given by Mr. Keyes, on page 887 of his article, as representing the Illinois succession of rocks. The following are the sections given:

	Missouri		Illinois	
Missourian Series	Atchison shales	500	Shales	235
	Forbes limestone	30	Effingham limestones	8
	Platte shales	200	Shales	200
	Plattsmouth limestone	50	Martinville limestones	25
	Lawrence shales	300	Shales	100
	Stanton limestones	20	Livingston limestones	20
	Parkville shales	100	Shales	75
	Iola limestones	30	Absent	
	Thayer shales	100	Shales	75
	Bethany limestones	50	Shoal limestones	7
Des Moines Series	Marais des C. shales	300	Shales	35
	Henrietta limestones	100	Mazon limestones	100
	Cherokee shales	250	Shales	200
Arkansan Series	Absent		Absent	

Kindly allow me to submit the following section, based upon stratigraphic studies of the State Geological Survey, which is more nearly representative of the conditions in Illinois:

McLeansboro	? Shales	100–150
	? Limestone (Effingham?)	8
	? Shales and sandstones	200?
	New Haven limestone	25
	Shales and sandstones	100–150
	Shoal Creek limestone	7
	Shale and some coal	100
	Carlinville limestone	7
	Shale, some limestone, and coal	200–300
	Limestone caprock No. 6 coal	6
Carbondale	Shales with No. 6 coal at top and No. 2 coal at base	300
Pottsville	Shales and sandstones	1,000

The Pottsville in the above section is represented, in Missouri, by strata lying rather below the middle of the Cherokee shales. The Carbondale formation is represented, in Missouri, by strata beginning about the middle of the Cherokee shales (at the horizon of the Bevier coal) and extending about to the top of the Des Moines series. The McLeansboro formation begins at about the same horizon as the Missourian series. Between the Missourian series and the Des Moines series, in Missouri, and the McLeansboro and Carbondale formations, in Illinois, there was probably, locally at least, a period of erosion followed by conspicuous sandstone deposition.

It seems to me that there is no special significance in the possible similarity in sequence, between the McLeansboro formation of Illinois and the Missourian series of Missouri, without paleontologic evidence to substantiate the correlations. At present, there are no data available that will justify the definite correlation of any horizon in the McLeansboro with any stratum or formation in the Missourian series.

GILBERT H. CADY,

Urbana, Ill. Illinois State Geological Survey.

The Zone Postal Law

Kindly permit me to refer to the appeal made in the advertisement of the American Authors' League of America, Inc., which appeared on the second page of the advertising columns of *Coal Age*, Dec. 29, and presented some strong arguments in favor of the repeal of the Postal-Zone Enactment, recently passed by Congress, to take effect July 1, 1918.

Owing to its bearing on circulation, there may be some hesitancy in permitting the discussion of this ques-

tion in the columns open to readers, were it not for the fact that the subject is one of even more vital interest to subscribers than to the publishers themselves. The former must eventually bear the burden of the increased expense created by this law.

As stated in the advertisement to which I have referred, this increase of expense will range from 50 to 900 per cent., according to the distance of the subscriber from the office of publication. For that reason, allow me to suggest that this injudicious legislation should have all the publicity possible.

In their hour of greatest need, the American people cannot afford to grope in the dark nor to Rip-Van-Winkleize themselves in an intellectual slumber, in respect to anything that menaces the free and unrestricted distribution of ideas throughout the length and breadth of the land.

Patriotic Mission of the Country's Press

One point that seems to me has not been thoroughly emphasized in the Authors' League advertisement is the patriotic service that is being rendered by the country's periodicals. Surely, we cannot undervalue their mission. It is the press more than any other instrument that is responsible for the patriotic harmony of our people throughout the length and breadth of the land.

The daily, weekly and monthly publications that are now distributed broadcast from sea to sea serve to vitalize and unify public opinion. Only by this means can that gospel of justice and truth, which is provoking in Prussianism a growing passion of hatred for us and our principles, be disseminated and this country and the world made to realize that the Emperor of Germany is fighting a world democracy that threatens his own autocratic rule.

In view of these facts, let Congress reflect and ask itself what per cent. of the American people who are now reading the best of these periodicals will be able to continue their subscriptions, after the excess carrier charges prescribed by the Zone-Postal Amendment have gone into effect. Then, what will be the result of this limitation in the dissemination of patriotic literature throughout the country, on the average citizen's patriotic ardor.

Effect of Obstructing the Avenues of News

It goes without saying that the first effect will be to create a widespread feeling that the law is unjust—Prussianizing the press which has been and is the great highway for the dissemination of the principles of democracy.

Scorning to pay this tax draft, which the advertisement of the Authors' League rightly styles "a tax on ideas," through the Postoffice Department that was never designed for any other purpose than to serve the people, the effect will be a waning interest in the loyal support of all measures that should, instead, be kept at white heat until victory is ours.

Finally, the injustice of this act is most apparent from the discrimination it makes between dwellers within the zone of publication and those further removed who must pay the excess demanded, simply because their occupation does not permit them to dwell in closer proximity to the great centers of thought. How many coal-mining officials and miners, let me ask, would be able to pursue their occupation in the Flatiron Building, in New York City? Is it justice to demand that, because of their more distant location, American citizens are subject to a tax on ideas that should be free as the expression of thought?

As stated previously, we must court no chance that portends calamity. Hence, as one of the great army of subscribers, I join in the appeal of publishers, whose interests are even less at stake than our own, to ask for the repeal of this law in the interest of patriotism and justice to all people. I heartily indorse the suggestion of writing our several congressmen soliciting their cooperation in securing the repeal of an unwise law that should never have been enacted. W. H. Noone.

Thomas, W. Va.

Test of a Man's Capability

Letter No. 4—I was greatly interested in the way John Rose, former district mine inspector in Tennessee, replied to a previous letter by "Mule Driver," *Coal Age*, Nov. 17, p. 860. I presume that both are good men, even though one of them appears to be a mule driver.

However, should these two men go to the stockyards, for the purpose of selecting mules for use in a mine, Mr. Mule Driver would probably show his superiority to our friend the inspector, by selecting mules having long ears and other characteristics that adapt them to mine work.

Capability Determined by a Man's Training

The driver's experience has taught him that the tips of the long ears of a mule, brushing the roof and timbers in a mine, will cause the animal to "duck," as the boys say, and avoid many a hard knock that the short-eared fellow will get, until he has learned the road.

Now, this is no reflection on the capability of the inspector, whose strong points lie in another line, as foreign to the mule driver as his knowledge of the mule is to the inspector. A man's capability must be examined in the line of his training. It goes without saying that a man that has worked his way up from the rank and file to hold a technical position in any industry has accomplished that end by study and observation, through years of toil that have made his experience valuable.

If I am not mistaken, my friend, Mr. Rose, belongs to a class that has arisen from coupling cars, at the age of 10 or 12 years, to the position of mine foreman at 40 and mine inspector a few years later. As Mr. Rose has pointed out in his letter, the capability of a man is not to be determined by the fact that he holds a certificate of competency to act as mine foreman, or because he can pick out a mule driver among the men who come to him for work.

Selection of Men For Particular Duties

The selection of men for the duties that they are competent to perform is most successfully performed, in my opinion, by submitting to them a previously arranged set of questions, for which a blank form may be prepared. The experienced foreman or superintendent can then decide, from an examination of the answers given by the man to these questions, what duties he is capable of performing.

As mine foreman, I have hired mule drivers with big feet, and I may not be credited with telling the truth when I say that they could run, yes, and stop a trip and save a mule, as they were by long training fully acquainted with that trick.

Among those who apply for work in mines are a style of "hangers on." Certainly, their Piccadilly collars and tan shoes do not recommend them for the work underground, but there is something besides that stamps them as being of a different kind from the man who plainly appears to have inherited capability from a child. In hiring men, the foreman must have such as insight into a man's nature that will reveal his true character.

Let me say, here, that a man's knowledge of mining is determined by his practical experience and greatly broadened by his habit of reading mining books and papers. It is my belief that a man who has never read much on mining or studied its principles is not equipped for a position of responsibilty underground—he is not the man for the job.

From an experience of 45 years in coal mines, I must admit that I knew little about capability, until ideas and methods were unfolded to me through the reading of *Mines and Minerals, The Colliery Guardian,* and last and towering above them all, *Coal Age.* My advice to men who desire to be capable, in the true sense of the word, is to read and study while they work.

R. W. LIGHTBURN,
West Leisenring, Penn. Mine Foreman.

Blacklisting To Prevent Accident

Letter No. 5—Referring to the claim of James T. Reynolds, *Coal Age,* Dec. 15, p. 1028, that "the most effectual means to obtain the desired safety in mines is the blacklisting of unsafe miners, through the hearty coöperation of all coal operators," allow me to ask, How do we discover an unsafe miner?

Most mining men will admit that, in the majority of cases, the unsafe miner is only discovered after he has been injured or killed as a result of his own ignorance, carelessness or reckless disregard of danger.

It is the duty of every fireboss and safety inspector to make safe miners. This is often slow work and can only be accomplished by making daily visits to each working place and patiently instructing each workman in regard to what is necessary to make his place safe, and telling him how he can mine his coal with the least danger to himself and others.

Should the fireboss discover danger in a place when making his morning rounds, whether this is due to the presence of gas or the lack of sufficient timbers to support the roof, he must block all entrances to the place with a suitable danger sign, report the danger in his book and notify the foreman, telling him what is needed to make the place safe. If the miner is permitted to do the work required to make his place safe, the fireboss or the safety inspector should oversee the job and not leave the place until he is satisfied that it is safe for work.

In my experience as safety inspector I have found many stubborn cases that require the exercise of tact and good judgment. If a place where a miner is at work needs more timber, I stop the man from working until it is timbered to my satisfaction. I do not allow any cars loaded until the needed timbers are in place. This generally has a good effect, as no miner likes to lose his turn, and he is more careful to keep his place in good order when he knows that the inspector is liable to appear any hour of the day.

When told to set timber a miner will often reply by saying that he will set the needed props as soon as he has finished loading the car he has on hand. Right then is the time for the inspector to act, and I say: "John, I am interested in your safety and welfare. Step over here where it is safe and, as I have time, I will stand the post for you." It is seldom that I have had to do the work, however, as the man naturally resents the idea that he is lazy and proceeds at once to set the timber. Neither is he likely to let the same thing occur again.

Appreciate the Efforts of Your Men

There are a lot of tricks in handling men, and I have found that to show appreciation of a miner's efforts to make his place safe is a big incentive to him to continue so doing. He is glad to know that I recognize that he understands how to protect himself. Where no consideration is given to the daily inspection of every working place in a mine, the men become careless and indifferent to danger.

In mines where the accident rate is on the increase it can generally be concluded that the work of inspection is on the decline. There are, of course, instances where men are killed by the fall of a rock that has been left without sufficient support, by the extraction of the coal after the inspector made his visit.

Now, from this review of the carelessness and neglect of miners to obey instructions and their disregard of danger, it is my belief that there are better methods of preventing accidents from these causes than that of "blacklisting." Coal operators should employ a sufficient number of firebosses and safety inspectors to discover where danger exists in time to avoid the results.

Backbone Needed in Dealing with Offenders

Further, mine officials should have backbone enough to report men who are stubborn and who disobey instructions or violate the mining law, and turn them over to the mine inspector of the district. I find, however, that this is seldom necessary where a man uses tact and common sense in dealing with the men in his charge. In any case I would not go so far as to use the blacklist, which may do an innocent man great injury.

Lack of discipline on the part of mine officials is responsible for much carelessness on the part of miners. In closing, let me urge every safety inspector to do his best to teach the men in his charge the best methods of protecting themselves and making the mines safe for work. After the manner of Admiral Nelson, at the battle of Trafalgar, who is reported to have said to his men, immediately before the battle, "England, today, expects every man to do his duty," let us strive to impress our men with the same spirit of loyalty to duty. By this means, we may hopefully expect to reduce the accident rate in mines.

ROBERT A. MARSHALL,
Farr, Colo. Safety Inspector.

INQUIRIES OF GENERAL INTEREST

Status of the Coal Jobber

Since the issuance of the Government's ruling regulating the selling price of coal and the jobber's commission, that class of dealers has been practically put out of business. The reason for this is found in the fact that coal operators are unwilling to sell their output to the jobber at a less price than that fixed by the Government. The consumer is not able to buy coal as cheaply as the larger dealer, who formerly was able to supply the general trade from his yards, which he kept stocked to meet the demands of his customers.

Under the authority granted by the Government, the Fuel Administration has fixed the price at which coal can be sold in each district, in conformity with the conditions existing relative to the mining and shipping of the product. At the same time, the jobber was allowed to make a profit of 15c. per ton on all coal sold by him. The difficulty arises, however, from the failure of the administrator to specify how this commission was to be paid.

Since the rulings were made, most of the coal operators have established their own sales agency and claim the right to absorb the jobber's commission. Since the arrangement went into effect, jobbers everywhere are receiving requests from their former customers who have always looked to them for their supply of fuel. They explain that they have found it impossible to buy enough coal to keep their power plants in continuous operation. In many cases these large consumers would be willing to pay the jobber's commission of 15c. per ton allowed by the Government, if they could be assured of a regular supply of coal.

Whenever these manufacturers and retail dealers have taken the matter up with the Fuel Administration, at Washington, they have received a reply telling them to refer their wants to the dealers who have supplied them regularly in the past. The outlook in this direction, however, is hopeless unless the jobber can secure his coal from the operators at the Government price less their own commission.

It will readily be seen that this is a situation that should be adjusted by the Fuel Administrator, in such a manner that the channels of trade shall be undisturbed and large dealers and manufacturers be able to obtain their supplies in the quantities required and as needed. The question arises: Has the coal operator the legal right to establish a sales agency and absorb the business of the jobber when he is unable to supply the local demands in cities and towns distant from the mines?

A way out of the difficulty has been suggested that, if legal, would permit the jobber to still continue in his business of supplying coal in large quantities to the manufacturers and dealers in his locality. The suggestion is that the jobber act as purchasing agent for his former customers and others who would get their supply of fuel from him. While many of these manufacturers and small dealers could not afford to hire a regular purchasing agent, they could pay a small commission for his services on a tonnage basis.

If this scheme is within the requirements of the law, a purchasing agent would take no part in the transaction further than to forward the order for coal to the operator and collect his own small commission from the consumer. The operator would ship and bill the coal direct to the consignee, who would pay him for the same at the fixed Government price. In addition, the consumer would pay the purchasing agent, for his services, a small percentage based on the tonnage received. What we desire to know, in this connection, is whether such a proceeding would be legal and within the law.

Grand Rapids, Mich. JOBBER.

The question asked by this correspondent was submitted by *Coal Age* to the United States Fuel Administration, at Washington, D. C., and brought the following response from H. D. Nims, who is connected with the Administration. In answer to the question asked, Mr. Nims writes as follows:

> It would be a violation of the spirit of the President's price-fixing orders to say that consumers could employ agents to purchase coal for them at the Government price. In effect, this would be allowing coal to get to the consumer at a price higher than that fixed by the Government. Our rulings, however, do not expressly prevent one from hiring such an agent on a salary basis, for the purpose of purchasing coal at the Government price; but, certainly, in no way should the operator or jobber who sells the coal receive a part of the agent's salary and thus secure for his coal more than that authorized.

Coal Age has interpreted the meaning of this response to be that there is nothing in the Government ruling to prevent a person acting as purchasing agent for one or more parties who are in the market for coal, provided (and this is important) that no part of the salary or commission paid to the agent for his services shall find its way into the pocket of the coal operator, who would thus be able to secure more for his coal than the price authorized by the Government.

In the authorization by the Government that enables the Fuel Administration to fix a price for the sale of coal there has been no intention to disturb the usual channels of trade, or to detract unnecessarily from any legitimate business. Doctor Garfield, as Fuel Administrator, has proceeded with great caution, and the prices fixed by his board have been made to conform to local conditions as closely as a thorough investigation of those conditions would permit. Clearly, the purpose of fixing the selling price of coal at the mines and elsewhere was for the protection of consumers, and to prevent the charging of extortionate prices by coal operators, owing to the extraordinary demand for this product. Some time will doubtless be required for the new conditions relating to the sale of coal to adjust themselves with equity and fairness to all.

EXAMINATION QUESTIONS

Miscellaneous Questions

(Answered by Request)

Ques.—What form of airway will give the most air with the same power, and why?

Ans.—A circular airway will give a larger quantity of air with the same power than either a square or rectangular airway of the same length. The reason is that the perimeter of a circle is less than that of a square or rectangle having the same area as the circle. The circular airway, therefore, presents a less rubbing surface, for the same length, than either a square or rectangular airway of equal sectional area.

Ques.—Which do you consider should be the larger, the upcast or the downcast, and why?

Ans.—The upcast shaft of a mine should always have a larger sectional area than the downcast shaft, for the reason that the return air current passing up the upcast has a generally larger volume than the intake current entering the mine by the downcast shaft. The larger volume of the upcast current is due to its higher temperature and the presence of gases generated in the mine workings.

Ques.—If you had charge of a mine, and the fan engine suddenly broke down, what would you expect to be the condition of the ventilation, and how would you continue to run the mine the rest of the day?

Ans.—If there is no duplicate engine for operating the fan, the men should be withdrawn from the mine at once, and no attempt should be made to continue to run the mine, until the engine can be repaired and the fan again put in operation. Even then, the mine must be examined by the firebosses and pronounced safe before the men are permitted to enter for work.

Ques.—Which is the more reliable, mechanical or natural ventilation, and why?

Ans.—Mechanical ventilation is always more reliable than natural ventilation, because the latter is subject to atmospheric changes that may completely destroy the ventilation in the mine. For example, natural ventilation depending on the higher temperature of the mine air may be rendered useless when the outside temperature approaches closely to that of the mine. Again, natural ventilation depending on the force of surface winds may be rendered useless, or the circulation in the mine changed, by a change in the direction of the wind, or by the dying out of the wind completely.

Ques.—What principles are involved in the construction of a safety lamp that would render one lamp more sensitive, in the detection of gas, than another?

Ans.—The sensitiveness of a safety lamp, in the detection of gas, as far as its construction is concerned, depends on the free entry of the air into the combustion chamber, at a point on a level with or below the lamp flame, so as to avoid conflicting ascending and descending currents within the lamp chimney, which would not only cause the lamp to smoke, but would mix the burnt gases that fill the upper portion of the chimney, with the air entering the combustion chamber and invalidate the test.

Also, if the entry of the air into the combustion chamber of a lamp is restricted the gaseous condition of the air surrounding the flame will be considerably changed and the test will not represent truly the air surrounding the lamp. The unbonneted Davy lamp affords the free access of the outside air to the lamp flame, to a greater extent than is true of any other type of lamp, which makes the Davy lamp more sensitive to gas than any lamp in use.

Ques.—A pair of headings, with the usual crosscuts and rising 1 in 4, is standing full of firedamp. The ventilating pressure is low. Give the various methods which may be used to restore the ventilation.

Ans.—Since these headings are driven to the rise, the gas will have a tendency to work toward the face of both headings, which makes its removal more difficult. The work must be begun by erecting a brattice in the mouth of the intake heading. Starting from the rib opposite the mouth of this heading, the brattice must be extended slowly into the heading, setting one post at a time and giving ample time for the air current passing around the end of the brattice to carry off the gas. All work must be performed on the intake side of the brattice, using safety lamps only and making careful tests to ascertain the progress of the work. In this manner, the brattice must be extended up the intake heading, as far as the last open crosscut.

At this juncture, ample time must be given and every possible means adopted to force the current against the air and gas in the other heading. To accomplish this, it will be necessary to increase the circulation as much as possible and to partially close the end of the brattice by drawing it over to the rib at the outby corner of the crosscut, so as to urge the air into the crosscut, instead of permitting it to return behind the brattice. When the crosscut is found to be taking the air, the brattice can be removed from the intake side and a canvas hung on the main entry so as to deflect the air and cause it to ventilate the two headings. This will give more freedom to the passage of air up the intake heading and force it through the crosscut driving the gas from the return heading.

After clearing the gas from the two headings below the open crosscut, the work of removing the gas accumulated above this crosscut should be commenced by extending a brattice from the outby corner of the last breakthrough, on the intake side. This brattice must be extended slowly toward the face, by setting a single post at a time, in the same manner as before, until all the gas has been removed from the face of the intake heading, after which the same method must be pursued in removing the gas from the face of the return heading. This is the only practicable and safe method of removing the gas filling a pair of rise headings.

COAL AND COKE NEWS

For the Busy Reader

A price of $2.25 has been fixed by the Fuel Administration for run-of-mine lignite at North Dakota mines.

* * *

To insure a steady flow of coal to New England by rail, the Fuel Administration has issued orders to 102 mines to furnish a certain number of cars per day. A total of 500 cars per day is to be forwarded to New England.

* * *

Shortage of coal was given by the Board of Health of Philadelphia as one of the reasons for 73 deaths in that city of pneumonia within a 24-hour period, the highest record of deaths from this disease in one day in the last five years.

* * *

The cold wave brought with it such pressing demands for fuel that an unusually large number of diversions of shipments became necessary to relieve the need for domestic fuel over most of the Middle West, as well as some of the Eastern States.

* * *

Eleven ships, aggregating 65,000 tons, have been turned over to the Fuel Administration by the Shipping Board to be used in transporting coal to New England. These vessels will continue in this service until a reserve sufficient to guarantee an adequate supply for the winter will have been assured to that section of the country.

* * *

A second producing district has been established by the Fuel Administration. The district consists of Boone, Clay, Logan, Mingo, Canawaha, Putnam and Nicholas Counties, of West Virginia, and those parts of the two adjoining counties in Kentucky, which are served by the Norfolk & Western R.R. A. H. Land, of Huntington, W. Va., has been named deputy distributor in charge of the new district.

* * *

By ordering all operators in the Pocahontas fields to give preference to tidewater shipments, the Fuel Administration has made it impossible to ship smokeless coal to Chicago and other Middle Western points. Substitution of coal from near-by fields is being undertaken by the Fuel Administration. Raymond Durham, the fuel administrator for Cook County, Illinois, is in Washington assisting in this substitution.

* * *

Approximately 250,000 tons of anthracite coal consigned to New York City were delayed at New Jersey terminals last week owing to ice in the Hudson and East Rivers, the Fuel Administration announced Jan. 3. In the same announcement, it was stated that no great amount of relief could be furnished through the Pennsylvania tubes and that no material improvement in the rate of delivery of coal is expected until the weather moderates.

* * *

Figures compiled from the returns to the Provost Marshal General show that 225,109 coal miners registered in accordance with the selective service law. The total number called from this industry was 74,109. The total number accepted, however, was 18,710 out of the 600,148 engaged in coal mining. Among the coal miners called 2601 asked to be exempted for industrial reasons. Of these claims 851, or 32.7 per cent., were granted.

* * *

Some idea of the seriousness of the existing coal shortage can be gained from the statement that "one hundred steamships, aggregating more than 1,000,000 tons gross, are being held in New York harbor through lack of coal, and the number is increasing daily." Some of these vessels have been waiting for coal for over a month. When it is remembered that these boats are principally engaged in carrying food supplies and munitions of war to our Allies in Europe the gravity of the situation can be better appreciated.

HARRISBURG, PENN.

The five men entombed by the cave-in at the Marcy Vein of the Barnum Colliery of the Pennsylvania Coal Co., at Pittston, Luzerne County, have been rescued virtually uninjured. Late last Saturday night a squad of rescuers, working through an emergency opening connected with No. 10 shaft, succeeded in learning that the imprisoned men were alive. The force was quickly increased in this particular section, and after several hours' work cleaning away the fallen rock the men were able to crawl out. At the time of the cave the men were able to escape to an old chamber, saving themselves from being crushed to death. One man employed in this section of the mine is still missing, but there is no colliery record that he was at work on the day of the cave-in, although he is absent from his boarding house, the proprietor of which is unable to say whether or not he went to work Saturday morning.

The cave was caused by pillar robbing. The Barnum colliery has been in operation for about 40 years, and all the mining being done in this vein is second mining. About 28 men were engaged in removing pillars, and without much warning the roof began to creep, and an acre or more of the chambers came down completely. Miners in the chambers nearest the roadway had bolted to the main gangway at the first signs of the creep. The air was squeezed from the chambers with such terrific force that the men were picked up like chips and hurled to the ground or against the ribs with terrific force.

The property damage is the most extensive ever suffered by this company which has a dozen big collieries in this section. Ten electric motors are buried by the fall and many of their operators had narrow escapes.

State Mine Inspector Robert Johnson and General Manager J. P. Jennings headed the rescue work. They found their progress shut off by the cave a few hundred feet from the main shaft and from No. 10 shaft, the second entrance to the vein. The ill-fated Twin mine, which contains the bodies of 58 men buried by a similar cave in 1896, is only a short distance away.

* * *

Immediate action by Congress to prohibit the sale of liquor within a five-mile zone from any coal mine or coke plant in the country will be asked as the result of a special conference of coke operators in the Connellsville district on Jan. 3. About 200 operators of the coke industry were present and listened to the address of Warren G. Blauvelt, coke advisor to Fuel Administrator Garfield. It developed that the 40,000 men employed in the coal mines and coke plants of the Connellsville region are working but half time and spending their checks in drinking bouts when they should be at work.

The car shortage and congestion of railroads was also freely discussed, and when Advisor Blauvelt stated that Director General McAdoo had given assurance of a car supply by Apr. 1 sufficient to move continuously the maximum daily output of every plant in the coke region, the consensus of opinion indicated a demand for prohibitory legislation affecting the immediate vicinites of these plants. In order to get a maximum output the operators stated that they must be freed from the endless difficulty with labor, and asked for legislation to remove the drinking factor from the problem. A nominating committee, composed of W. H. Klingerman, operating head of the H. C. Frick Coke Co.; J. M. Jamison and J. H. Hileman, Jr., of Pittsburgh; Charles E. Lenhart, L. L. Willard, William A. Stone and R. M. Fry, all prominent coke men of Uniontown, was named to appoint an executive committee of three, who will regulate the future coke output of the Connellsville region for the duration of the war and as long afterward as the Fuel Administration may deem advisable.

* * *

Differences between the Auditor General and the officers of the State Workmen's Compensation Insurance Fund over the Auditor General's desire to audit the fund to ascertain whether it can be made self-sustaining at the present rate of expenditure for administration is attracting considerable attention in the bituminous region, as many of the soft-coal companies carry their compensation insurance with the state fund.

Attorney General Brown has advised the fund officers that the Auditor General has no power to audit the fund. The Auditor General is studying the law relative to his powers and it is believed that under the act of 1810 he can send Miles A. Dawson, an insurance expert, to the office to audit the books.

Auditor General Snyder states that his only purpose in actuating the proposition to ascertain the condition of the fund was to make it a sure protection of the corporations insured and for the people who benefit by the compensation act, and that in order to carry this purpose into effect the department will insist on a reduction in the payroll and other expenditures and a closer inspection of the management.

The Auditor General laid particular stress upon the fact that he regretted the action of the manager of the board in attempting to prevent an inspection of the records, as he feared it might cause an unjustified impression that would have an adverse effect upon the policies issued by the board or the solvency of the fund, which remain unquestioned.

* * *

Every coal miner using explosives will have to obtain a Federal explosives license before he can buy squibs from his town grocer or small merchant, or get his supply through his licensed mine foreman, according to a ruling by the Bureau of Mines received by Clerk of Courts Wagner of Luzerne County on Jan. 3.

This is an important decision, affecting all miners and vendors, and may retard the production of coal unless the coal companies take steps to facilitate the buying of squibs at the mine openings where the powder is sold. It has been the custom of many miners living in the small mining towns throughout the region to purchase their squibs at their grocer's or other small dealers handling mine supplies.

PENNSYLVANIA

Anthracite

Harwood—The large electric plant of the Lehigh Coal and Navigation Co.'s electric plant suffered heavy damage on Jan. 1, when one of the large turbine's engines in some unknown manner caught fire and was completely burned and put out of service. For a time there were fears that the fire might spread to adjoining equipment in the plant, but through hard work on the part of workmen and electricians the blaze was confined to the one engine. The plant furnishes power to a number of coal companies in the Lehigh region.

Shenandoah—While five men were tightening straps on a heavy pressure steam pipe at the McTurk Colliery's inside stable on Jan. 2, it burst, flooding the stable with steam. The men escaped with slight burns, but seven mules were killed and eight others were so severely burned that they are likely to die. The loss is $5000.

Reading—The Reading Coal and Iron Co. shipped but 881 cars on Jan. 4, which is about half the normal output. It is said that the breakers are filled with coal, but that it was simply impossible to handle it, due to the extreme low temperature. Never before has it been necessary to cut down the tonnage of freight and coalings for so long a period. Notwithstanding the modern locomotives that are now employed, there have been instances when they have been frozen up solidly and it was necessary to draw fires.

Wilkes-Barre—The Wilkes-Barre chamber of commerce recently decided to give its support to the movement to utilize waste mine gas for commercial and domestic purposes as a means of saving coal. The question has been before the chamber since the time Governor Brumbaugh called men from various towns and cities to consider the question. The chamber here has decided to do all in its power to find a satisfactory way of using the great amount of waste gas.

Duryea—Fire completely destroyed the William A. Breaker of the Lehigh Valley Coal Co. on Jan. 3, with a loss estimated at about $200,000. The boiler house and all other buildings were saved, largely by the efforts of the fire departments of three towns, which were called in.

General Manager Chase has stated that the 1200 tons a day produced at this colliery would not be interrupted and the 500 men employed would not be thrown out of work. Arrangements have been made to send the coal run through the William A. Breaker to the Stevens, Coxey and Austin breakers. The men who would be thrown out of work by the destruction of the breaker have been given positions at other collieries. The officials of the company say that the fire was of accidental origin.

Jeddo—Plans are being drawn for the erection of a washery at No. 4 colliery of the G. B. Markle Coal Co. The banks of that place will be prepared for market just as soon as the new plant is complete and will add greatly to the tonnage of the company. Operations of this company on the North side have been hampered during the week as a result of the severe weather freezing springs and streams. The water supply has been at a minimum and it is said that unless relief is gained in a very short time the water for the collieries will have to be hauled.

Bituminous

Uniontown—On railroad sidings between Ache Junction and Brownsville, on the Coal Lick Run branch of the Pennsylvania R.R., and between Martin and Brownsville on the same branch, there are 1200 freight cars tied up. Many of the cars are loaded with coal. As a result of the congestion many mines in this region have shut down and coal miners are leaving to seek work in other fields.

The Vesta Coal and Coke Co. has awarded contract for the erection of 45 new dwelling houses, to be constructed at the Vesta No. 6 works, near West Brownsville. The contract price is $130,000. The homes are to be modern in every respect. It is expected to have the houses completed within three months.

Midland—In order to keep its work in continued operation, the Crucible Steel Company, with offices in Pittsburgh and its plant here, obtained 15 cars of coal from the Pittsburgh fuel administrator's office. This consignment has been received in addition to a number of cars of coke.

WEST VIRGINIA

Charleston—The last official act of State Chief of the Department of Mines Earl A. Henry was to revoke the certificates issued by the department to W. M. Printiss, superintendent, and I. M. Pitman, mine foreman, of Yukon Pocahontas Mine No. 1, at Susanna, McDowell County, where an explosion occurred Dec. 15 and resulted in the loss of 18 lives. Chief Henry said that had the mine foreman and superintendent performed their duties, the explosion could have been prevented because the mine was in first-class condition.

Deeds, agreements and other papers in a $385,000 coal land transaction, by which the Black Band Fuel Co. has disposed of its coal, lumber, mining, merchandising, railroad and other interests at Olcott, on Coal River, in the southwestern end of Kanawha County, to John Kresge, of Boston, were placed on record in the Kanawha county clerk's office. Five thousand acres of mineral and timber lands, including mines in operation, stock in the Kanawha Central R.R. and the company stores were involved in the deal.

Morgantown—A deal was recently closed by Blaine St. Clair, of Union District, by which he leases his three veins of coal—the Sewickley, the Redstone and the upper Freeport—to Charles Kuhn and others of Westmoreland County, Pennsylvania. The coal, which underlies a tract of 150 acres overlooking the Monongahela River, will be mined on a royalty basis. Mr. St. Clair is to receive a royalty of 15c. a ton and is guaranteed at least $1500 a year.

ALABAMA

Birmingham—The Gulf States Steel Co. has taken over the properties of the Sayre estate, consisting of 15,000 acres of coal lands, with a good mine under operation, 150 coke ovens in full operation and railroad appurtenances to the mines and ovens. The deal involves a cash outlay of $700,000. The Gulf States Steel Co. will immediately take over the properties and figure on some big developments.

The Birmingham-Trussville Iron Co. is making good progress in the construction of its coal washery and other plant structures at Labuco mines, from which an output of 1000 tons per day is now being obtained. A large number of dwellings are in course of construction for housing employees. The 300 coke ovens of this company at Trussville are now in blast, the coke being disposed of to outside interests pending the placing in blast of its furnaces, which are practically ready for the torch.

ILLINOIS

Pana—The North mine of the Pana Coal Co., which has been idle for almost ten years, will be reopened as son as repairs and improvements are completed. About 200 men will be employed. This will give Pana four of the largest mines in the state, two operated by the Pana company and one each by the Penwell and Smith-Lohr companies.

Carlinville—Development work has been begun on the Herman Schoper property near here, recently purchased by the Standard Oil Co. It is understood that two shafts will be sunk. Company houses are to be erected for the employees but assurances have been given by C. M. Clark, the Standard Oil official in charge of the development, that all business will be transacted through Carlinville. Merchants have been asked to contribute to a fund of $5000 for building a cinder road to the mines. The field to be developed includes parts of South Otter, Honey Point, Shaw's Point, Nilwood and Carlinville townships. The Standard has also bought the mine of the Carlinville Coal Co. and is preparing to double its output.

Bethalto—The mine of John Kowaljik here will have to close because Kowaljik is an enemy alien and cannot, therefore, obtain a license to buy powder. He applied to the explosives license agent at Edwardsville. It was refused, and his case was reported to the Bureau of Mines at Washington. Kowaljik was born in Germany. He has been in this country since 1913 and took out first papers in 1916.

Lincoln—An attempt is to be made to reopen the Lincoln mine which has been closed several weeks on account of fire. It is believed the flames have been smothered by sealing. The shaft will be opened in a few days and if any fire remains an attempt will be made to extinguish it.

Farmersville—The Elly Coal Co. is preparing to reopen its mine here, which has been closed three years. The débris has been cleared away and the mine will be retimbered. It formerly employed 300 men. B. C. Perry and Mr. Hamilton, of Girard, are interested in the company.

Orient—The mine of the Chicago, Wilmington and Franklin Coal Co. has been idle several days on account of a fire that destroyed the screening plant.

OHIO

Martins Ferry—The Clarkson Coal Co.'s No. 2 mine at Fairpoint has devised a scheme to keep the mine going at top speed regardless of the lack of motive power on the B. & O. division. The loaded cars are being dumped in an open field and already the pile of coal has assumed enormous proportions. Should the present rail congestion be relieved in the near future it will be an easy matter to load the cars from the elevated field position.

A representative of the Consolidated Copper Co., of Canada, has been in Belmont County looking after the purchase of coal lands for his company. He states that coal there costs $11 a ton, his idea being to purchase coal lands and operate the mines, shipping the product direct.

Steubenville—Announcement was made here that the Adena Coal Co., which has been operating in the vicinity of Adena for the past two years, has purchased the Laura O. Hastings farm of 33 acres and a five-acre tract from W. P. Moore, paying $9575 for the land, or $250 an acre, the highest price ever paid for coal property in that section of the county.

WASHINGTON

Wilkeson—All hope of rescuing the six entombed miners who were trapped by a vein of water in the mines of the Wilkeson Coal and Coke Co. has been given up, although 200 men are working on the cave-in.

Foreign News

Tokio, Japan—Discovery of the most extensive deposit of anthracite ever found on the main island of Japan is announced. It extends for more than 18 miles along mountain ranges and, as it is near the naval base at Maizurn and in close proximity to the railway, the discovery is regarded as of great importance.

Quebec, Que.—At the annual meeting of the British Columbia Skeena Coal Co., Dec. 28, it was announced that recent investigations on the 30,000 acres of anthracite coal lands on the Upper Skeena River, northwest of Prince Rupert, had led to the discovery of large deposits resembling in analysis the smokeless coals of Pennsylvania. This is stated to be the only known occurrence of this kind of coal in Canada, and as it is much in demand for naval purposes, the find is regarded as important.

Berlin, Germany—In its issue of Dec. 11, "Vorwaerts" states that the coal business in Berlin is simply chaos, and the resultant misery in the poorer quarters is beyond words. Berlin municipal enterprises are almost in an equally bad position. Berlin's gas and electricity works, the city overhead and underground railways, are so scantily furnished with coal that they "live from hand to mouth." The slightest interference with the present slender supplies, "such as any frosty day may bring, must compel a partial, if not total, stoppage." The authorities are said to be letting matters drift.

Personals

Edward Wallace, editor of the "United Mine Workers' Journal," has enlisted in the Canadian Army. Wallace was rejected by the American Army officers, being 50 years of age.

Ralph E. Buckman has resigned his position as superintendent for the Indian Creek Coal and Coke Co., to accept a similar position with the Langeloth Coal Co. at Langeloth, Washington County, Pennsylvania.

Joseph B. Connell, connected with the C. M. Dodson Coal Co., Hazleton, Penn., in the capacity of superintendent of the mines at Beaver Brook, Morea and Locust Mountain, has been appointed general manager for the company, with headquarters in Bethlehem.

Frederick W. Wyant resigned his position in the engineering department of the Vandalia Coal Co. at Linton, Ind., to accept the position of division engineer of the Somerset division of the United Coal Corporation. He entered upon his new duties Dec. 26, with headquarters at Boswell, Somerset County, Pennsylvania.

Frank J. Foley, manager of the mining section of the Industrial department, Westinghouse Electric and Manufacturing Co., has accepted a position as manager of the mining and traction department of the Edison Storage Battery Co., located at Orange, N. J. Mr. Foley, who is a graduate of Pratt Institute, Brooklyn, has been with the Westinghouse company for 12 years, commencing with the service department in New York City and later being transferred to the industrial department at East Pittsburgh.

Obituary

Howell Harris, of Scranton, Penn., one of the best known mining engineers in Pennsylvania, died at his home on Jan. 2 after a long illness. He was 55 years old and was general superintendent of the mining properties operated by the late William Connell.

Industrial News

Norton, Va.—The Norton Coal Co. is having plans prepared for the construction of fifty additional coke ovens, to provide for increased capacity.

Lincoln, Neb.—The Grand River Coal Co. has filed notice of an increase in its capitalization from $25,000 to $175,000 to provide for extensions and improvements.

Jackson, Ky.—The Jackson Block Coal Co. has filed notice of an increase in its capitalization from $12,000 to $30,000 to provide for expansion.

Marion, Ohio—In order to get better cooperation among the retailers, the Marion Retail Coal Dealers' Association has been organized. It is planned to secure a more equitable distribution of the available coal supply.

Philadelphia, Penn.—The Pennsylvania R.R. has placed an embargo on all carload lots of freight, except foodstuffs and coal, coming from other lines to the Pennsylvania. The embargo affects all Pennsylvania R.R. lines east of Pittsburgh.

Cleveland, Ohio—With low gas pressure, zero weather and a shortage of coal, this city is again threatened with darkened streets. One plant of the Otis Steel Co., employing 600 men, recently closed because of fuel shortage, it is said.

Columbus, Ohio—For the first time in history, solid trains of coal were being rushed through the Union passenger station with right of way over all other service. The coal is from Ohio, Kentucky and West Virginia fields and consigned to the East.

Reading, Penn.—E. H. Deysher, John M. Ebersole and Clifford H. Price, Reading, and G. E. Aleman, Shoemakersville, have organized the Anthracite Reclaiming Co., and are planning for the construction of river coal washeries at Arders and Kline's Grove, near Sunbury.

St. Louis, Mo.—Thomas R. Mould, of St. Louis, has filed suit in the Belleville Circuit Court against the Suburban Coal and Mining Co. for $150,000 damages, alleging that the company has undermined property owned by him in St. Clair County and has removed several thousand tons of coal.

Wellston, Ohio—The Model Service Co., of Defiance, has purchased a short branch of the Cincinnati, Hamilton & Dayton running between Wellston and Dean from a junk dealer of Cincinnati. The purchasing company will operate the road in the interests of the coal mines along the line.

Pittsburgh, Penn.—The Verner Coal and Coke Co.'s purchases in Findley township, Allegheny County, have been increased by the company taking title to 72 acres from James Lee Mossey, and 36 acres from David McBride, for which $25,424 was paid, according to deeds recorded.

Wilkes-Barre, Penn.—In conformity with the State law signed by Governor Brumbaugh July 19, 1917, requiring motor-driven ambulances instead of the horse- or mule-driven ambulance, local coal companies during the week received a number of machines designed especially for mine service

Columbus, Ohio—The Ohio Fuel Administration has issued orders denying certain wagon mines in Ohio cars unless they comply with the orders of the Fuel Administration as to price. It is claimed that many of the mines are paying no attention to the price schedule as fixed by the Fuel Administration.

Lexington, Ky.—The State Railroad Commission on Feb. 7 will sit here to hear the complaints of the Lexington and Versailles, Ky., against the Cincinnati, New Orleans & Texas Pacific. This is to the effect that the railroad is discriminating in rates on coal to cities opposite Cincinnati against Lexington and Nicholasville.

Akron, Ohio—The coal pool at Akron, Ohio, was started the first of the year with T. E. Barry, of the Pittsburgh Coal Co., as director. The committee consists of Jay Converse, secretary-treasurer of the Stillwater Coal Co.; John Rawley, of the Akron Coal Co.; Louis Klages, of the Klages Coal and Ice Co., and George Smith, a jobber.

Indianapolis, Ind.—Coal production in Indiana during the month of December will total nearly 2,000,000 tons, more coal than has ever before been taken out of the mines of the state in one month, according to E. I. Lewis, chairman of the public service commission. This figure is based on reports made by railroads and checked by mine operators.

New Albany, Ind.—Options are being taken on coal land in Pike and Warrick Counties, Indiana, as a result of the report that the Baltimore & Ohio R.R. would construct a line through that section. The switch would open up thousands of acres of lands, showing veins 6 and 7 ft. thick. Much of it could be stripped by steam shovels, it is said.

Wilkes-Barre, Penn.—A ruling has been made by the board of appeals for the middle judicial exemption district that miners who are actually engaged in the cutting of coal are to receive deferred classifications and will be enrolled in the second class. The board members believe that such men can be of more service to the country at work in the mines than in the army.

South Charleston, Ohio—In an address at a farmers' meeting here recently Governor Cox of Ohio declared that the 1,000,000-ton excess of coal in the Northwest, "occasioned by the blunder of Fuel Administrator Garfield," is responsible in large measure for lack of fuel in the East and for transports loaded with supplies for troops in foreign countries, reported tied up at ports.

Columbus, Ohio—The Ohio Fuel Administration is making a campaign to increase the efficiency of coal burned in steam plants throughout Ohio. As a result a number of Economy Inspectors have been employed and are going about instructing firemen in the proper use of fuel. At one plant the inspectors secured 50 per cent. better efficiency. The plant formerly used 90 tons daily.

Tyrone, Penn.—The J. C. Stone Co., manufacturers of mining and ventilating machinery, has recently passed its ten-year milestone in business. Started a decade ago, the success of the venture has proved greater than the founders' most sanguine expectations. The company is beginning its second ten years with flattering prospects, and is backed by an organization of expert and efficient men.

Louisville, Ky.—The Jefferson County Fuel Committee has revised the margins allowed to dealers on coal, increasing that on domestic coals and reducing that on industrial coals, and, generally, equalizing the entire list. Margins now in effect between cost to the dealers for the coal and his selling prices are as follows: Domestic sizes, $1.95; industrial coal, $1.50; anthracite, $2.10; coke, $2.50.

Akron, Ohio—About 10 mines of the Buckeye Coal and Railway Co., located in the Hocking Valley, were forced to suspend operations last week because of lack of water for the boilers of the power plant located at Jobs. For some time there had been a shortage of water, and it was hauled from Nelsonville, a distance of six miles. Lack of motive power on the Hocking Valley Ry. has made it necessary to suspend.

Columbus, Ohio—Three mines formerly owned by the Luhrig Coal Co., of Cincinnati, located on the main line of the Baltimore & Ohio west of Athens, will soon be put into operation by New York capitalists, which recently secured possession of the property. The mines have been idle for more than three years. It is expected to work about 400 men when the mines are ready for operation.

Connellsville, Penn.—Negotiations were closed recently by which the Smithfield Coal and Coke Co., plant was consolidated with the Clark Coal Co., which was incorporated some time ago by E. C. Higbee, W. D. McGinnis, Bruce F. Sterling and C. D. Clarke. The combine, which will be known as the Clark Coal Co., will have 80 acres of Connellsville coking coal, 34 ovens and a very complete coking equipment.

Columbus, Ohio—The Columbus Railway, Power and Light Co., which has been hampered because of lack of fuel, has secured a half interest in a coal mine in West Virginia which has a daily capacity of 1500 tons. But soon after securing the interest the greater part of the output was commandeered by the Federal Government. Application has been made for better transportation service to get an adequate coal supply.

Pittsburgh, Penn.—In a drive by the Government on violators of the coal price fixing regulations, Harry Hamilton, president of the Standard Coal Co., was placed under arrest at the Hotel Nixon, Butler. Hamilton is accused of charging consumers in excess of $2.45 a ton for run-of-mine coal, the price fixed by National Fuel Administrator H. A. Garfield. The Government asserts that Hamilton's company charged as much as 80c. a ton more than the fixed price.

New York, N. Y.—Shipment of coal was given preference over passenger traffic in an effort to relieve the coal famine here and in New England. The Pennsylvania R.R. tubes under the Hudson River are now being used for freight as well as passenger traffic to rush coal to Long Island and points served by the New Haven lines. The Baltimore & Ohio R.R. uses the Pennsylvania station in Manhattan for its passenger traffic, the change necessitating a revision of the schedule of both roads.

Philadelphia, Penn.—Government confiscation of Pennsylvania coal brought a protest from State Fuel Administrator Potter in the form of a telegram to Federal Administrator Garfield. The confiscation objected to is that which takes coal from this state for points in the South and Southwest, where there are coal fields adequate to provide for present fuel requirements. Mr. Potter was forced to this step by the increasingly desperate situation in this city, where there are now thousands of homes without coal.

Columbus, Ohio—The Buckeye Coal and Railway Co., of Columbus, will soon equip 20 mines, located in the Nelsonville and Bailey Run districts, with electrical power. In all, 12 mines in the Nelsonville district will be furnished with power from the Ohio Light and Power Co., Newark, Ohio. Eight mines in the Bailey Run district will be supplied with power from the Hocking Power Co. All the mines are practically new operations, and when the electrical equipment is complete the output will be largely increased.

Connellsville, Penn.—By the sale of the 100-acre coal field underlying the Fayette County poor farm on Jan. 5 at $5000 an acre, a new record value in coal was attained. George Whyel, a prominent coal operator of western Pennsylvania, is the purchaser. The last high-water mark sale was made by J. V. Thompson to a Pittsburgh capitalist, who paid $1800 an acre for the Pittsburgh 9-ft. seam in the Klondyke region. Recently H. C. Frick purchased 12,000 acres of the Thompson coal lands in the same vein at $550 an acre.

Pittsburgh, Penn.—A. S. McKone, banker, of Tunnelton, W. Va., purchased 350 acres of coal land, containing the Upper Freeport seam of coal, on the Baltimore & Ohio R.R., at the west end of the Tunnelton, Preston County, W. Va., from the Merchants Coal Corporation, a subsidiary of the United Coal Corporation, together with 150 acres from other parties. A company has been organized and work has been started on the development and construction of a mine, to be turned over, when completed, to the Baltimore & Ohio R.R., for coaling locomotives.

St. Louis, Mo.—Wallace Crossley, Missouri Fuel Administrator, is getting after the operators who double up as jobbers for the sake of the 15c. a ton allowed to jobbers under the Government's price schedule. Quite a number of the operators have been doing this, he says, and if they don't stop it they will be prosecuted. He says that evidence is being gathered against them. The jobber, he declares, is a necessary factor in the coal trade and he intends to protect legitimate jobbers from a continuance of the practice.

Huntingdon, Penn.—While the citizens of Huntingdon and other central Pennsylvania towns are suffering from lack of coal, the sidings of the Huntingdon & Broadtop R.R. here contain over 800 cars loaded with bituminous coal from the South Broadtop region. These loaded cars have been on the sidings here for more than a month, while others are accumulating all along the line. There is no present indication of any outward movement of the loaded cars, and a general explanation is given by company employees that the delay in shipment is due to lack of motive power.

Indianapolis, Ind.—Paul Poynter, who has charge of the wagon mines in the state for the Federal Fuel Administration, announced recently that he had issued an order increasing the prices which wagon mine operators may charge for their product when it is shipped over the railroads. This does not do away with the Government regulation on the price at the mouth of the mine, where the coal is sold for wagon delivery. The mine price of Indiana coal as fixed by the Government is $2.65 per ton of Indiana lump, $2.40 for mine-run and $2.15 for screenings. Mr. Poynter's increases for the wagon mines that have turned to rail delivery are $3.25 for Indiana lump, $3 for mine run and $2.75 for screenings.

Chicago, Ill.—After an existence of nine years as a department of the Chicago Pneumatic Tool Co., the motor truck interests of the company were on Jan. 1 taken over by a new organization known as the Little Giant Truck Company. The motor-truck department of the tool company had grown to such proportions that a separate organization to handle its many interests became necessary. The Little Giant Truck Co. is owned and controlled by the Chicago Pneumatic Tool Co., and the officers are the same—W. O. Duntley, president; W. B. Seelig, secretary; L. Beardsley, treasurer, with T. J. Hudson, sales manager. The headquarters will remain in the Little Giant Building, 1615 Michigan Ave.

St. Louis, Mo.—The Board of Aldermen, by a unanimous vote, has rejected the proposition of a committee of railroad heads, of which W. S. McChesney, president of the Terminal Association, is chairman, to use the municipal free bridge provided they are permitted to continue charging the 20c. a ton arbitrary on coal. The proposition was based on the contention that the Interstate Commerce Commission, sustained by the United States Supreme Court, has held that 20c. is a reasonable charge for the hauling and switching service in transporting coal from East St. Louis to St. Louis. Its rejection is on the ground that neither the commission nor the court has passed upon the question of an arbitrary for the use of the free bridge. Mayor Kiel and city officials have gone to Washington to offer the bridge to Director-General McAdoo for the use of the railroads.

MARKET DEPARTMENT

GENERAL REVIEW

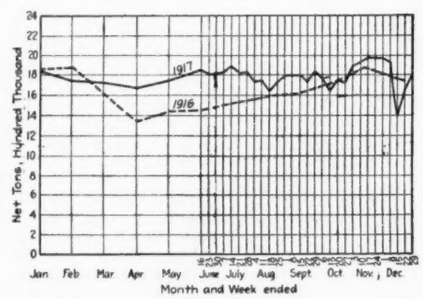
Cold weather causes excessive domestic demand. Car supply holding back distribution. Conditions, especially in the West, slightly better.

The production and distribution of anthracite is proceeding as rapidly as transportation facilities will permit. This is not, however, fast enough to satisfy the demand. The various local fuel administration boards and committees are perfecting their organizations, the efforts to relieve congestion on the railroads are beginning to make themselves felt, there is a slightly better car supply, and it is believed that conditions in general are easier than they have been in the recent past. It can hardly be expected that government regulation of the railroads will work any miracle to coal distribution. It is believed, however, that the beginning of better transportation facilities has been made. From all over the country the demand of industrial consumers, especially for bituminous, are heavy, and it is feared that in many localities, even in spite of such economy measures as lightless nights and the like, many industrial plants will be compelled to suspend operations. Conditions in New England along this line became especially acute, and a priority order was issued for the shipment of 500 cars daily to the New England administrator, to be distributed by him as necessity might dictate. It was feared that this priority order to New England would curtail the supply of fuel to other parts of the country, such as New York City and its vicinity, and a request was immediately dispatched to the National Fuel Administrator, urging that this order be rescinded. This request was denied, and it is feared by many that serious economic results will follow. This will not necessarily be the case, provided increased transportation can be secured. Throughout the West and Middle West the situation has been somewhat relieved. Coal standing on tracks in various railroad yards has been in several instances commandeered by local fuel authorities, with the result that temporary local stringency has been to a greater or less extent relieved. The production prospects are in several instances somewhat better than a week or two weeks ago. In the Pittsburgh district several operators of small mines were arrested for evasion of the government price. The tonnage involved in these evasions was almost insignificant. The conditions in the manufacturing centers of the Middle West such as Detroit, Chicago and St. Louis, have been somewhat relieved during the past week. A freer movement of coal over the railroads has effected this change. The needs of St. Louis are for the time being at least well provided for. Chicago has received heavier shipments, but no stocking could be accomplished. Detroit, also, has received more coal during the past week than the previous one, but this has had little effect upon dealers' yards or the supplies held by them. Many domestic consumers in Detroit have suffered severely during the past month. In the extreme West it is believed that the situation will be somewhat relieved by the substitution of coals mined near at hand in place of the somewhat better fuel brought in by long railroad hauls. The shipment of coal from docks in Milwaukee to the states lying to the northwest has ceased, and it is believed that Wisconsin's supply for the present winter is both ample and secure. There is nowhere manifest a disposition to be critical as to the kind or quality of fuel secured. The principal concern of consumers, both industrial and domestic, is to get coal—something that will burn and generate heat, and the question of whether it is lump, egg or screenings is of entirely secondary importance. While many localities are still on the ragged edge of want, and nowhere does the supply equal the demand, it may be safely said that the situation as a whole is better than it has been in the recent past.

A Year Ago—Retail anthracite trade easier, but the wholesale situation as stiff as ever. Very sharp decline in bituminous quotations. Preliminary discussions on new contracts. Improved car supply and heavy shipments in the Middle West.

COAL PRODUCTION

In the five working days of Christmas week the soft-coal mines are estimated to have produced 8,964,000 net tons, an average per working day of 1,793,000 tons. The recovery from the extraordinary depression of mid-December continues, but the rate of production has not yet attained the mark set in November. The increase was effected in spite of continued adverse weather conditions. A preliminary estimate places the December production at 42,050,000 tons, the lowest recorded since April, 1917. On this basis the entire 1917 production should be approximately 544,142,000 tons, representing an increase over 1916 of 8.3 per cent. The production of beehive coke, following the bituminous industry as a whole, rose from 96,086 net tons, during the preceding week, to 107,655 tons per working day. Anthracite shipments were reported as 29,228 cars.



CARLOADS OF COAL AND COKE ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS WEEK ENDED

District	Dec. 8	Dec. 15	Dec. 22	Dec. 29
Bituminous shipments, 114 roads.	198,161	149,122	177,599*	158,290†
Anthracite shipments, 9 roads...	40,566	31,672	36,083	29,228†
Beehive coke shipments, 4 roads...	12,509	10,335	11,835*	11,050†

* Revised from last report. † Subject to revision.

BUSINESS OPINIONS

The Iron Age—The first week in the new year has brought blast furnace and steel works' operation to the verge of complete demoralization. Western blizzards have made vastly worse what has been for weeks a serious situation and embargoes on shipments have made conditions at rolling mills almost hopeless. Scores of blast furnaces have been banked in the Pittsburgh, Youngstown, Wheeling, Cleveland and Chicago districts. Steel works in the same territories have been able to operate at but 50 to 75 per cent. of capacity. The East, while spared fresh snow blockades, has had record low temperatures and so little fuel has been delivered to steel plants that working schedules have gone to pieces. Never has the industry been so generally crippled or with so poor a prospect of any early return to normal conditions.

Bradstreets—Post-holiday influences, inventorying, intensely cold weather east and south and heavy snows at the west have made for a quiet week in ordinary distributive trade, and weather plus coal and car shortages have curtailed manufacture and industry.

The Dry Goods Economist — Manufacturers, wholesalers and selling agents in most lines of dry goods have completed their stock-taking and are now in a position to take up the problems of the new year with a full knowledge of the actual results of 1917 business.

The American Wool and Cotton Reporter—More confidence and interest was evident in the wool trade for the week under review. The trade is gradually recovering from the shock of the government regulation announcement. The market is quiet but very strong.

Marshall Field & Co.—Current wholesale shipments of dry goods for the week are well ahead of the corresponding period of last year. Road sales for both immediate and future delivery are about equal to the same week in 1917. The number of customers in the market has been slightly less than in the same week a year ago. The market on domestic cotton continues strong. Collections are good.

Atlantic Seaboard

BOSTON

Situation grows worse rapidly. Emergency supplies cannot begin to cope with demands. First cargoes arrive for Fuel Administration. All-rail deliveries also begin to reach destinations.

Bituminous — The Panama collier "Achilles" was recently diverted for one trip to help out the urgent situation in New England. But 12,400 tons is only a drop in the bucket. The bulk of the cargo went to hospitals and similar institutions that were very near distress for fuel. The New England order issued both by the Federal Fuel Administrator and by the Director-General of Railroads was secured through the efforts of J. J. Storrow, New England fuel administrator, and is intended to virtually give priority to the needs of this territory. Certain mines are designated for a given amount of coal per day, in all aggregating 500 cars from the different roads, all of which is understood to be equipment in addition to the allottment of cars the designated mines would regularly receive, the order being effective Jan. 8.

The railroads are also among the consumers in serious straits for fuel, and part of the 500-car order is to relieve them. A long list of industrial plants engaged in work on war orders is also included and strenuous efforts are being made to meet the most pressing of the demands. The City of Lynn finds its reserve so far depleted that all its industries have agreed to work on half time until an adequate supply can be received. The harbor, as in the case of New Bedford, Fall River, and other ports, is completely frozen over and water movement has been so completely paralyzed that any relief must come by rail from points like Boston where the harbor is navigable.

Meanwhile, various steamers are arriving, and it is hoped that with milder weather the end of the week will see some relief. The famine is widespread, and "acute" is not a sufficiently strong word to describe the situation. A great many plants have been obliged to shut down and there is no knowing what will be the outcome. Should the New England order be revoked, the situation will be hopeless.

NEW YORK

Coal situation easier, but still serious. The authorities assist in relieving the suffering among the poor. Receipts show increase and prospects are brighter. Lack of bituminous delays sailings. Car shortage shows no improvement and miners are restless.

Anthracite—The strenuous efforts made by the local fuel administration, railroad officials and coalmen to relieve the coal situation have been partially successful and there has been a better distribution of fuel during this week. This market has gone through the hardest week in its history. Temperatures each day were either below or near the zero mark. The rivers and New York Bay were filled with heavy ice and in the vicinity of the coal terminals this became so thick that the services of the heaviest tugs in the harbor were necessary to penetrate it and make a channel for the coalboats.

Relieving the situation meant hard work for the state and county fuel administration and for A. H. Smith, president of the New York Central Lines, who is the director-general of the railroads in the East. They were ably assisted by the State Fuel Conservation Committee.

The extreme low temperatures caused much suffering and with the rivers and bay practically one mass of ice the situation became serious. There were large tonnages of coal reported as being at the loading docks but it was impossible to move it. Heavy railroad tugs assisted by U. S. Navy tugs and, in one instance, by one of the big Sound steamers, were em-

ployed in making a passageway for the coal barges and after many hours of hard work were successful in their efforts.

Several of the companies also aided in the work of relief by sending coal in cars direct to their piers along the North River where the coal was loaded into the dealers' wagons. The situation in Brooklyn and other parts of Long Island was helped by the sending of coal trains through the Pennsylvania tunnels to Long Island City, while dealers whose yards are located along the Brooklyn water-front went several days without coal owing to the frozen condition of Newtown Creek and Gowanus Canal.

The low temperatures played havoc with the supplies in the cellar bins and many residents, fearing a coal famine, closed their homes and took residence in apartment hotels for the winter. Churches in many instances closed their main buildings and conducted services in smaller rooms. Many of the city hospitals were within a few hours of being without coal and in some instances similar institutions were without fuel.

The appeals from the poor became so numerous that Mayor Hylan instructed the police to ascertain how much coal is in the bins of the residents of the city and to solicit contributions of coal for division among those who needed it. In this way more than 1000 tons was divided in small lots among the needy. The forces of the various city departments were used in making the deliveries. Mayor Hylan also appointed a committee headed by Harry T. Peters to devise ways and means to conserve the coal supply and also to raise funds for the purchase of coal for the poor. Besides Mr. Peters the committee has among its members M. F. Burns, Thomas Farrell, Rudolph Reimer, T. V. Patterson and J. F. Bermingham, all prominent coalmen.

The failure of a general adherence to the rules of the State Fuel Administrator that all advertising signs and other unnecessary lights be darkened six nights a week, Saturday excepted, resulted in the appointment of a special committee to enforce the rule.

The efforts to relieve the situation during the time the nearby waters were filled with ice, resulted in the loss in four days of 27 barges each containing an average of 500 tons of coal.

While no definite announcement has been received here regarding the pooling of all anthracite shipments at tidewater docks, some dealers look upon this as the only solution of the situation.

With the demand for domestic coals leading, the steam sizes are short and hard to get. Wholesale dealers are unable to find any supplies, all production having apparently been sold at the mines or already on contract.

Continued efforts to secure the fixing of a gross margin for retail dealers in Manhattan and the Bronx has resulted in the county fuel administrator deciding upon the following margins which have been sent to Washington for approval by the Fuel Administration officials. Domestic sizes, $2.50; pea and soft coal, $2.10 and buckwheat, rice and barley, $1.90. These margins will not make any substantial change in the retail prices of coal in the two boroughs.

The threatened tie-up of the drivers and auto-truck operators of the retail dealers has been adjusted by the granting of weekly increases in wages of $3.

Receipts have been so small that most retail dealers have practically discontinued deliveries. Instead they have disposed of their stocks at the yards at 60 cents per cwt., the prices fixed by the Fuel Administration authorities.

One of the most serious situations confronting lower New York was the issuing of an order by the New Jersey fuel authorities preventing the carting of coal from that state across the river to New York. A continuance of this order would have resulted in shutting off the coal supply for all of the big office buildings, but an appeal to Washington soon resulted in its being rescinded.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$6.30	$7.05
Egg	6.20	6.95
Stove	6.45	7.20
Chestnut	6.55	7.30
Pea	5.05	5.80
Buck	4.30@5.00	5.50@6.00
Rice	3.75@3.95	4.50@5.00
Barley	3.25@3.50	4.00@4.25
Boiler	3.50@3.75	

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—Conditions in the bituminous market continue to be serious with no immediate prospect of betterment. Supplies are not nearly sufficient to meet the demand and the condition of the water surrounding this city has interfered greatly with the transportation problem.

The delay in shipping has become extremely serious. The number of vessels tied up in the harbor because of the lack of fuel has reached 200 notwithstanding the efforts made to secure bunker supplies for them. Among the ships are passenger vessels carrying mails to foreign countries. The piers are also congested with freight destined for other lands.

A Washington dispatch that arguments had been presented to Dr. Garfield for an advance of $1.05 per ton in the mine price of bituminous coal, making the price $3.50 instead of $2.45, found much favor among the dealers here and it was the belief that at least part of the increase would be granted.

Dumping into barges at the docks has become more active but owing to the ice floes delivery at the various yards has been slow. The shortage has seriously impeded various industrial plants and many of them have been forced to suspend operations pending the receipt of fuel.

The Government operation of railroads has, so far, not made any appreciable difference in car supply. Operators report conditions similar to those existing for the past several weeks. Mine workers are restless.

Local dealers believe the local situation is just as serious as the New England situation and that more coal should be sent here. Three barges loaded for Boston and containing about 1200 tons were taken by the local fuel administration authorities on Saturday and devoted to local uses.

The order of Director-General of Railroads McAdoo increasing the demurrage rates, to take effect on Jan. 21 will no doubt have a potent effect upon the car situation and ought to result in an improvement.

No definite announcement has been made regarding the renewal of contracts, but it is expected that except in special instances, few contracts will be made for the coming year.

It was stated early this week that 1,009,000 tons less of bituminous coal has been received in this city since July of 1917 than were received during the corresponding period of the previous year.

Dr. Garfield notified State Fuel Administrator Wiggin on Wednesday that he would not rescind the priority order giving New England 500 cars of bituminous coal per day. The refusal came after appeals for more coal had been made to Dr. Garfield by Mr. Wiggin and Mayor Hylan, the latter asking that 1500 cars of coal be allotted to New York daily and given priority orders on the railroads. Dr. Garfield notified Mayor Hylan that he would not issue priority orders to send coal to New York.

Unless a normal supply of coal is brought to New York quickly it is feared many of the large manufacturing companies will have to shut down. It is also feared that most of the public schools will be closed next week.

PHILADELPHIA

Anthacite trade badly upset by zero weather. Shipments light and much suffering among consumers. National authorities order relief. New retail prices in effect, despite protests. Steam coal in extreme demand. Bituminous held back by abnormal weather. Better car supply promised. No price increase yet. New bunker price effective. No contract activity.

Anthracite—Trade conditions have never been so upset in the city's history. With the thermometer hovering near zero for a week, and from 10 to 20 degrees below throughout the mining region, there have been panicky times to say the least. As the dealers' yards were bare, or nearly so, before the severe weather arrived, the situation soon became desperate. There has been much suffering and in two instances the deaths of infants were ascribed to the lack of heat in the homes. Many manufacturing plants also closed and at the end of the week at least 25 per cent. of the city schools were closed for want of fuel.

Lately the weather moderated to near the freezing point and while this helped conditions, yet there continued to be much suffering and many of the schools were unable to reopen. The various fuel committees admitted that they were at their wits' end. They finally succeeded in convincing Secretary McAdoo of the seriousness of the situation and he, late in the week, ordered an embargo on freight of all kinds with the exception of coal and food-stuffs on all roads from Pottsville to Philadelphia. Even at this it was almost a week before the effect began to make itself manifest.

A canvass of the retail yards disclosed about 75 per cent. of them closed with "no coal" signs displayed. In the southern section of the city and parts of West Philadelphia, conditions were most alarming, because whenever a car of coal arrived there were mild riots. A crowd would gather, climb on the car and help itself. Policemen appeared none too anxious to make arrests, and while they tried to make an example of a few, the prisoners were soon discharged by the magistrates with a reprimand. In one day as many as ten cars of coal were taken on the street in this manner, the loss falling upon the railroad company, as the cars had not as yet been delivered to the dealers' yards. Many other cars had from one to five or more tons removed and in many cases this loss fell on the dealers, as their only remedy would be to refuse the car or ask to have it re-weighed.

Government control of prices has proved a blessing to the consumer. Consumers clamoring for coal offered almost any price, and no one questioned the present rates. It is not believed there is any extortion and the price arrangement of a $2.50 gross margin over actual cost as fixed by the coal committee is being adhered to. Retail prices run about as follows: Egg, $8.80 to $9.20; stove, $9 to $9.70; chestnut, $9.15 to $9.80; pea, $7.55 to $7.90. This range includes the lowest rates as charged by dealers who are handling company coal, and the higher ones as charged by those who are being supplied by the independents. Where a dealer buys from both the large and small operators some effort is being made to average the prices.

This week the Fuel Committee has taken advantage of the power recently granted it to confiscate coal in cases of urgent need. A recent instance is the case of directors of big companies who for years have been in the custom of buying their domestic coal by the carload and having it hauled to their homes by a dealer. This week there were several cars so shipped, but Chairman Lewis immediately notified the dealers to allow consignees but 30 days' supply, and to take the balance into their stock in the regular way.

The City Fuel Committee stated this week that all public buildings, such as hotels and theaters, violating the regulation as to keeping the temperatures of their buildings at 68 deg., would be subject to more drastic rulings in regard to the use of heat, a copy of which supplementary rules has already been published.

The city authorities have now reached a clear understanding with the fuel committee and are thoroughly coöperating with it. Many of the city departments, such as the water works and police stations have been running on small stocks, yet it is not believed they will suffer interruption. Already a number of public spirited business men with heavy reserves of coal have offered their supply of coal to the city in case of need.

This week the local gas company has been running half page notices in the papers asking consumers to conserve the supply and also warning them that the gas may be suddenly shut off and cautioning the people not to allow lights to burn all night, because of the resulting danger should the flow suddenly stop.

The small sizes of coal are in abnormal demand and apparently there is no steam coal for sale. None of the large companies and few of the independents will book any additional business. The prices continue to be held in check and in no way reflect what could be obtained. Buckwheat at $4.15, or $4.35 through brokers, is about the limit, although the demand is enormous. Rice at $3.35 or $3.55 is almost as active. Barley is also strong at $2.35 or $2.55. Culm has lost none of its recent popularity and is selling close to $1.50.

The prices per gross ton f.o.b. cars for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$5.90	$6.05	Buck	$3.15	$3.75
Egg	4.80	6.00	Rice	2.65	3.65
Stove	5.05	6.35	Boiler	2.45	3.55
Nut	5.15	6.40	Barley	2.15	2.40
Pea	3.75	4.65			

Bituminous — The situation has grown more serious of late, with the quantity of coal for commercial use far below the demand. Many manufacturing plants are working on short time, while others have been closed down entirely for periods running from two days to two weeks. It was fully believed that with the Government control of the railroads the question of car supply would have been on a fair way to solution by this time, but the zero weather which has prevailed entirely upset the plans in this direction. However, with a fair rise in temperature recently it is now believed that the improvement of rail

conditions will be reflected in an increased car supply.

The various fuel committees have lately devoted considerable attention to the bituminous trade and one of the striking effects of their activities seems to be the gradual elimination of a coal supply to industries engaged in strictly non-essential production. As a consequence a large proportion of coal reaching here is going to plants where it is most badly needed.

Reports from the various districts shipping into this market are that the car supply has recently been only from 10 per cent. to 25 per cent. for commercial coal, although one good-sized operation has not received a single commercial car for loading since Dec. 20.

The mine operators were greatly disappointed at not being granted permission by the Fuel Administration to increase prices on Jan. 1, as had been fully expected by many. Nevertheless, they feel that their claims cannot be much longer denied, and the lowest price they figure on at this time is $3 per net ton. While they believe they should have even more than this in order to allow of a reasonable profit, still they will accept a $3 price as an evidence that the authorities are beginning to appreciate their situation.

The new bunker coal price of $3.80 went into effect on Jan. 1, this being an advance of $1.35 per net ton over the old price of $2.45, as allowed by the Fuel Administration.

While a number of good-sized contracts expired with the close of the old year, it has not increased the amount of coal for sale at the Government price, as any coal released in that manner is being applied mostly on still existing contracts, which even with the additional tonnage are far behind their quotas. So far as can be learned there is no activity in the contract business.

BALTIMORE

Bituminous supply a little easier after one of the worst weeks in history of the trade. Confiscation by fuel administrator relieves anthracite shortage somewhat. New retail prices set.

Bituminous—The first week of the new year proved one of the worst in the history of the coal trade, but the past few days brought a better supply of fuel and emergency needs are being met fairly well. After Chesapeake Bay and its tributaries had become ice-bound to such an extent that even the largest vessels could not be moved, an accumulation of coal became evident at tidewater piers. Some of this was diverted by Washington to New England, and finally another portion was commandeered by the local fuel administrator.

This action came after the local supply had dwindled to such an extent that industries in several cases were forced to part production and after the lighting company's gas supply had run so low that the system failed in many homes. With oil almost an impossibility and with many homes without coal, the failure of gas supply for heating and lighting caused real suffering for about 24 hr., as the trouble came when the thermometer stood close to zero. Conditions in the bay were finally improved by battleships sent from Norfolk to break channels in the ice to the harbor and piers. City departments were so hard hit by lack of fuel that the high pressure fire service was without coal for a brief period. The commandeering of 250 cars of coal on Monday for local distribution, however, broke the worst of the needs.

Anthracite—The hard coal situation also was finally saved by seizure of coal awheel near the city, destined elsewhere but held up by rail congestion. Previous to the seizure many homes were without coal, schools and other public buildings were closed for lack of heat, and there was much inconvenience and suffering. Reports came of children and others dying from cold and exposure. Coal dealers were at their wits' end, with long lines of would-be purchasers and little or no coal to distribute. Vast damage was done by bursting water pipes in unheated buildings.

Prices have not been the main consideration, and an advance of 25 cents a ton on prepared sizes, as authorized by the fuel administrator, passed practically unnoticed by the public. The advance was to take the place of one made each year here to care for added cost of winter hauling, and which did not become effective in October as usual. The new prices, based on the mine costs, plus freight, plus war tax and plus a profit margin of $2 on prepared sizes and $1.75 on pea coal, are as follows:

Hard white ash—Broken, $9.65; egg, $9.35; stove, $9.60; chestnut, $9.75; pea, $8.10, and buckwheat, $7.35; Sunbury—Egg, $9.60; stove, $9.85; chestnut, $10; Lykens Valley—Egg, $10.10; stove, $10.35; chestnut, $10.35.

The prices are based on the long ton, and where there is bagging or carrying the actual extra cost is added, to be not less than 25 cents a ton. Bushel sales shall be at the rate of 50 cents for prepared sizes for 80 lb.; and 40 cents for pea coal. Five cents off is allowed on each bushel where purchasers carry their own coal.

Lake Markets

PITTSBURGH

Production prospects slightly more promising. Local supplies fair. Arrests for violating set prices.

The week opened with car supplies rather poor but on the whole railroad conditions are a trifle more promising. The Greek Christmas, which fell on Monday, cut into labor supplies materially.

Local fuel supplies are practically sufficient, although there are no stocks to speak of. Reports were circulated late last week that many of the office buildings were short of coal and were in danger of being without light and heat this week. A number of coal companies near Pittsburgh accordingly made an offer to supply trucks with coal on Sunday, but there were few applicants and the conclusion reached is that conditions were not nearly as bad as painted.

The amount of coal in transit between mines and steel works has been decreased somewhat, receipts of steam, gas and by-product coal at steel works being somewhat improved. Steel output is still considerably restricted, however, by fuel shortage.

A half dozen or more arrests have been made of coal company officials on the charge of violating the set prices, and the authorities claim to have ample evidence to convict. All the cases thus far involve small producers. According to such information as has leaked out, the means taken to cover violation of the law were crude.

There is practically no free coal in the open market, but it is believed a moderate tonnage is changing hands, sellers picking out consumers to whom they prefer to sell but reporting no coal to offer against general inquiries. The market remains quotable at the set prices, $2.45 for mine-run, $2.20 for slack and $2.70 for screened, per net ton at mine, Pittsburgh district, with 15c. permitted to be charged in addition in case of sales by brokers.

BUFFALO

No improvement in the bituminous situation, but cars show some increase. Prospect of plants closing soon if no relief is afforded. Anthracite moving fairly well. Consumption heavy.

Bituminous—No member of the trade will admit that the situation has improved as yet, though the railroad changes must furnish more ability to move freight in a short time. The removal of passenger trains must produce that effect. The need of this is shown by the report from the Allegheny Valley coal region, which is estimated to have had about one day's supply of cars last week. From all sides come reports of this or that plant just ready to close for want of coal, though none of account have done so in this district yet.

The coal consumers of this city have not yet begun to learn the art of saving coal. Despite the constant fear of running out of fuel the office buildings are burning all day long hundreds of electric lights many of which are not needed. The local fuel administrator has posted notices forbidding such waste, but it does not occur to anyone that he is the one meant.

The Canadian coal-selling licenses come out much cut down, showing that the authorities believe that country to have received more than its share of coal lately.

All these indications go to show that the situation is strained and is likely to remain so to a great extent, no matter what is done. Add to this the fact that the country is trying to do a large amount of extra work and the reason for congestion is fully explained.

The bituminous jobbers seem willing to give up all contracts as soon as they expire, some of them expressing a desire to do so. Then the following Government prices will be general:

	Slack	Lump
Pittsburgh	$3.75	$4.25
Bessemer	3.70	4.20
Allegheny Valley	3.60	4.10

All per net ton, f.o.b. Buffalo.

Anthracite—The local supply has not been up to the consumption during the late cold snap, but the weather is mild again and normal conditions will soon restore something of confidence on the part of consumers. If they would not take more coal than they need the supply would be sufficient. During the late zero weather complaints multiplied, but they will fall off now unless the cold weather returns.

Some of the outlying districts appear to be destitute and there are instances where the town authorities have given permits to cut down the shade trees. It is the general idea that the winter severity cannot last long, as we have already had enough coal weather and snow for more than an ordinary winter.

TORONTO

Coal situation very serious. Shortage due to extreme cold, causing much suffering. Civic relief system inadequate. Fuel controller trying to arrange for supplies.

The coal situation has become very serious. Owing to protracted severe weather the supplies of fuel arriving have been entirely inadequate to meet a greatly increased demand and much suffering and hardship have resulted. This is by no means confined to the poorer classes, as many who have ordered and paid for a supply weeks ahead are unable to obtain it.

To relieve the distress the civic coal depots are delivering quarter and half-ton lots at the rate of $10.50 per ton, but have been overwhelmed with orders which they cannot fill for some time as the supply at their disposal is limited. Reports from other Ontario cities and towns indicate that similar conditions are general.

Fuel controller Magrath, now in Washington, telegraphs that he has received the promise of early shipments to Canada and that these will receive precedence over other traffic on the Canadian railways. Quotations are merely nominal, prices actually paid being variable.

DETROIT

With the railroads reporting a somewhat freer movement of soft coal, the supply appears little improved. Anthracite continues scarce. Domestic consumers suffer hardships.

Bituminous—Despite the fact that reports from railroad traffic departments indicate a considerable improvement in the volume of incoming shipments of bituminous caol, the deficiency in supply continues. Many of the industrial plants including some that are employed in turning out work for the Government are working on a day-to-day supply, which it is feared might be cut off should snowfall or a tightening of railroad congestion curtail the volume of receipts.

Demand continues urgent from steam plants. The fact that no reserve exists on which they may draw, while industrial consumption is quite materially increased in comparison with last winter makes the situation dangerous. Vigorous protest is being prepared for presentation to the Michigan and National fuel administrators, against the shipment to Detroit of Indiana coal instead of the Kentucky or West Virginia product. The objection is made by industrial consumers that the freight rate on the Indiana coal is 7c. a ton higher, while its efficiency in steam production is pronounced far inferior to the coal from the other fields, which heretofore have contributed in greater part to Detroit's supply.

The Detroit board of education has under consideration a plan to close the public schools for a month, extending the school term into the summer. The purpose of the plan is to permit distribution of supplies of coal that have been provided for school needs.

Anthracite—Very little improvement is noticeable in the quantity of anthracite coming to Detroit. The cargoes of hard coal, which the fuel administration confiscated on the steamers "Thomas Barlum" and "Richard J. Reiss" have been unloaded and distributed. The fuel administration has no further supply in sight on which to draw.

COLUMBUS

Continued cold weather is still causing considerable stringency in the coal trade of Ohio. Shortage of domestic stocks reported.

The cold wave which arrived a week ago still continues and as a consequence there is a considerable shortage of domestic and steam fuel stocks. Domestic users are probably in the worst shape as retail supplies are limited. Deliveries under the direction of the county fuel committees are being rushed and up to date only a few isolated cases of great suffering have been reported. On the whole the situation is not as bad as was the case during the first cold snap and the steps that have been taken for relief are proving efficacious.

Retailers are still restricting deliveries to small loads in an effort to make the available supply go around. Retail prices are firm at the levels fixed some time ago. Pocahontas is quite scarce and only a small

portion of the usual tonnage is coming into this market. West Virginia splints are coming in better with improvement in railroad facilities.

The steam business is active. Owing to Federal restrictions certain plants making non-essentials have been deprived of fuel. Supplies have been secured by schools, hospitals and public institutions. Some of the public utilities are short of fuel but few have had to suspend operations. In most instances they have curtailed service. Restrictions as to unnecessary sign and store lighting have relieved matters to a large extent.

Car supply, or in other words, efficiency of motive power on railroads has been better during the week and as a result the output in certain districts has been larger. Even with the intervention of a holiday the production in the Hocking Valley district is estimated at 75 per cent. Jackson and Pomeroy are credited with 65 per cent. and other districts, excepting eastern Ohio, about 50 per cent. In eastern Ohio the car service has been bad and the output is about 35 to 45 per cent. and a large portion of that is railroad fuel.

Prices on short tons f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump, inch and a quarter, three-quarter, nut and egg	$2.70	$3.05	$2.70
Mine run	2.45	2.70	2.45
Nut, pea and slack and coarse slack	2.20	2.45	2.20

CINCINNATI

Continued severe weather and limited receipts of coal have kept the city on the edge of suffering. Careful distribution is meeting the situation.

Continued wintry weather, with low temperatures and snow, has marked the past week, although moderation at the close was noted. The limited receipts of coal necessitated extremely careful handling of the small supplies thus made available, in order to give to those actually in need of it enough fuel to prevent suffering. This was done, it seems, although it was at the expense of some industrial consumers, who were constantly on the verge of a total absence of fuel, and, consequently, of the necessity of shutting down.

There appears to be no permanent relief in sight for some time to come, as the transportation tangle is by no means straightened out, and the amount of coal in the city in the hands of dealers and consumers is greatly below normal, so that it will take some time, with favorable conditions as to transportation, to enable the desired suppleis to be stored. If any less coal were being received it would be impossible to take care of the public; and the situation at points north of Cincinnati is even worse, judging from reports.

LOUISVILLE

Coal business is Government-regulated in almost everything but name and Kentucky trade sees no developments. Hears of Government taking over industry without batting an eye.

One of the features of the week in the Kentucky coal trade has been the widely-discussed report that the Government is shortly to take over entire operation of the coal mines of the country. In view of the fact that the industry is already to most intents and purposes Government-controlled, the leading members of the Kentucky trade express no special interest in the report.

The situation is still a difficult one, although there has been some little improvement in the supply of cars, at least in parts of the Kentucky field and a larger volume of coal has gone out. Priority orders are determining the manner of distribution so that sales organizations are more or less inactive, in spite of a general deluge of inquiries and requests for consideration.

Another week of cold weather, with gas failures all over the central section, has greatly stinulated the domestic demand and increased the requirements of the retail trade. An increase of 15c. a ton has been granted the trade in Louisville on certain domestic grades, while there is still a restriction on quantities allowed and all retailers are behind a week or more on deliveries. Failures of certain grades of coal are common and in many homes and factories fuel other than that for which furnaces were designed is being burned. Lightless days and nights and other fuel-saving devices are being put into effect and generally observed. A promise of milder weather is hailed with joy by the trade.

BIRMINGHAM

Domestic situation remains critical, though relief is afforded in a measure by warmer weather and priority shipments. Steam coal being eagerly sought through the aid of state and national fuel administrators. Output at mines slowly returning to normal after the holidays. Traffic congestion hinders movement greatly.

While the shortage of domestic coal throughout southern territory continues acute, the pressure has been relieved slightly by a few days of relatively warm weather and the diversion of coal to local dealers and to other points in the state where a coal famine existed, by orders of the fuel administrator. Local dealers have received a few cars each during the week, which were quickly unloaded into waiting wagons and trucks. Few yards have any coal on hand at all, the inventory of stocks at the close of the week showing the smallest stock yet reported.

The threatened closing of the city schools for lack of fuel has been temporarily avoided by the coöperation of local producers, who have promised sufficient shipments to tide over the present critical situation. It is probable that the city will close down its lighting plant and secure its current from the local electric company to further conserve its fuel supply. The current used by the Birmingham Railway, Light and Power Co. is generated by water-power on the Coosa River.

Brokers and distributing agencies are being much perplexed by the conflicting priority orders of state and national fuel administrators and are much "in the air" as to how to proceed with coal distribution. The belief is expressed, however, that the Government will soon centralize the distribution in each field in the hands of a local committee, and will designate the essential industries which are to be supplied as near as possible with full fuel requirements. This is thought to be the most important measure of relief which could be adopted, as the continued parcelling out of the limited supply to every class of consumer is hazarding the operation of public utilities and manufacturing plants essential to the national welfare.

Operations at the mines have not assumed normal proportions as yet, though the output was better than a week ago. Several mines operated Sunday and probably produced several thousand tons of coal, mostly for local distribution.

Congested traffic conditions are impeding the movement of coal from the mines, those on the Frisco lines reporting that cars were allowed to stand under load for a week in some instances before being moved to the consignee.

Coke

CONNELLSVILLE

Car supplies improved. Receipts at furnaces somewhat better. Less coke under contract.

Car supplies were poor indeed all last week, but this week opened with an excellent supply placed, this condition combining unfortunately with the fact that Monday was the "Greek Christmas" of the Julian calendar, falling 13 days after the Christmas of the Gregorian calendar, and the supply of labor for loading was rather poor.

There has been a partial cleanup of the large amount of coke in transit, or rather nominally in transit, between the ovens and the blast furnaces, whereby receipts at blast furnaces have increased a trifle while shipments last week were no better than formerly. An occasional banked furnace has been able to resume, but production of pig iron as a whole shows practically no improvement.

There remain few, if any, price adjustment contracts, subject to the spot market, these having practically all expired Dec. 31. On the other hand, a number of new contracts, made before prices were set Sept. 24, have become operative. The general opinion is that there is less coke under contract now than formerly, and supplies offered in the open market should increase if there is anything like full production. At the moment there are practically no offerings. The market remains quotable at $6 for furnace, $7 for 72-hr. selected foundry and $7.30 for crushed, over 1 in. per net ton at ovens.

Upon the request of Warren S. Blauvelt, in charge of coke under the Fuel Administration, a meeting of all the coke operators in the Connellsville region was called for last Thursday, at Uniontown, Mr. Blauvelt meeting about 200 of the operators. He made a strong plea for energetic action to increase the production of coke, while the operators insisted that much better transportation facilities were needed. The following committee was appointed: Charles Lenhart, vice president of the Producers' Coke Co., chairman; Walter S. Klingerman, president of the H. C. Frick Coke Co.; Hart Hillman, of J. H. Hillman & Sons Co.; L. L. Willard, general superintendent of the Rainey interests; John Jamison of Jamison Coal and Coke Co.; W. A. Stone, of W. A. Stone & Co.; R. M. Fry, of the Orient Coke Co. This general committee is to appoint an executive committee of three to operate directly under the Fuel Administration, and the committee is getting its organization in shape this week.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Dec. 29 at 251,398 tons, a decrease of 39,976 tons, and shipments at 255,079 tons, a decrease of 33,678 tons.

Buffalo—While it is far from easy to get shipments or in fact to make them, the movement is kept up in some manner. The supply of iron ore is adequate for the present and the demand for pig iron is good. There is some uncertainty as to what can be done when the contracts for coke expire, as the Government will not allow them to be renewed in their present form, but so long as the coke is made the trade will get it in some way. Nominal coke prices are still $7 and $6 at the ovens for foundry and furnace, to which must be added $1.85 freight.

Birmingham—Federal control of the railroads has not thus far afforded much relief in the movement of coke, as equipment is still short, and its restricted use is embarrassing industries securing foundry coke from local producers. Deliveries are slow and insufficient to meet the needs of consumers. Production is closely approximating the output prior to the holidays. Inability to secure even repair material without great delay is causing a large aggregate loss in output. The demand is unusually strong.

Middle Western

GENERAL REVIEW

The coal trade is much concerned over the report that Fuel Administrator Garfield contemplates radical changes in coal distribution.

Operators, jobbers and retail dealers, express much interest in the report from Washington, that radical changes are to be made at an early date by the Federal Fuel Administrator. If current reports be true—and they are not now questioned—the United States Fuel Administration is to be decentralized at an early date. Deputy fuel administrators are to be appointed in each producing district, 15 or 20 in the country, who will have exclusive charge of the allotment of all coal sold and shipped.

The plan, it is understood, contemplates the joining of Illinois and Indiana as a producing territory, and the appointment of a deputy fuel administrator in charge, with headquarters probably in Chicago. His work will be confined to an association of producers and he will have ample authority to dictate the movement of the production for the territory allotted.

Should this plan be put into effect, no doubt there would be immediately installed a zoning system. This will restrirt roal movement to territory lying in the closest proximity of the direct haul to the producing mines, and coal would not be allowed to go beyond the zone boundaries. It is planned to do away entirely with cross country hauls, the hauling of one coal into and through another producing territory to a destination beyond.

Under this plan it will be seen that Illinois and Indiana users will be compelled to rely on a vastly greater supply from their own states, thereby replacing a large volume of eastern coal, that has heretofore been marketed here. It is likely that Illinois coal will supply Iowa and Missouri, and that Indiana production will find placement in its own state and Chicago. Eastern coal will no doubt continue to move into Wisconsin through the Lake gateway. Michigan also will be supplied by Lake boats through the same channels as Wisconsin.

The apparent urgent and immediate need for coal, in this part of the country near the producing centers, fully warrants the belief that early steps will be taken to divert all coal from the Northwest, for a period of 60 days, allowing a heavier movement throughout Illinois and Iowa, where the requests for relief are urgent. Reports reaching us indicate that there is sufficient coal in stock in the Northwestern territory to last for several months, this accumulation is the result of priority shipments made before Lake traffic closed, and will, it is expected, be exhausted before more is allowed to go there.

If the decentralized plan be put into force, it will not be necessary to make appeals for relief to Washington, and much of the formalities can be dispensed with by making direct appeals to the deputy in charge, who will then make allotments.

Much concern is manifest as to who the deputy will be. That the appointee should be a man entirely familiar with coal movement, and trade relationship is unquestionably an important matter to the Mid-western operators. Particularly is this true with the operators of Illinois and Indiana, where extreme care is exercised in the preparation, and vast sums of money have been expended in properly equipping plants in order to size coal to meet the needs of some particular class of trade.

The holiday season with the coal miners seems to be over judging from the manner in which production has been increasing during the past week. Generally speaking, operators are getting maximum tonnage, and have had an ample car supply, with the exception of some few small operations that have but one line of road. It was feared that the heavy snow that fell the first of the week, would have a bad effect on the railroads, but little or no trouble has been noted, particularly on such roads as the Burlington, Illinois Central and Chicago & Eastern Illinois, the heaviest coal carrying roads in the Mid-West section. In some localities, reports are being made of badly delayed shipments, but such reports are in many cases minor incidents, and do not reflect the showing that the railroads are making in handling coal shipments.

It is gratifying to both operator and dealer, as well as good news for the consumers that there is relief in sight, and what a few days ago threatened to be a deplorable condition seems to have been met and overcome. The relief it is understood is but temporary, however, should the present efforts by operators, miners, and railroads indefinitely continue, there will be no further need for alarm as far as Western bituminous coal supply is concerned, provided the Fuel Administrator does not determine other channels of movement for outputs in Illinois and Indiana. Local and state fuel administrators are active in their efforts to give relief where it is needed, and in every case the operators are responding with prompt shipments of a sufficient volume of coal to relieve the situation.

The situation as regards Eastern bituminous and hard coal is, if anything, more serious than at any time for several years. Seldom is there a car of Eastern bituminous reaching the smaller towns in this section, and the hard coal situation is but little better. What anthracite arrives is quickly absorbed in the larger terminal centers.

CHICAGO

The supply of soft coal received during the past week exceeds that of the previous three weeks. Situation greatly relieved.

The latter part of last week, City Fuel Administrator Durham called into conference a number of prominent operators and association secretaries and requested that extra efforts be made during the coming week to get sufficient coal into Chicago to take care of the urgent needs. His request was met by operators from all sections of the state, with the result that a supply of almost 3000 cars were immediately headed for this market. Each operator was allowed to serve his own clientele, and no confusion was noted. Under the threat of having coal confiscated, it was thought to be a better policy to allow the producer to serve his own trade. By this means the confusion that would follow should coal have been taken and placed in yards and plants unaccustomed to its use was avoided.

While there is no substantial stock of coal at any yard or plant, it is believed by those who have followed the matter closely that there is enough coal en route to this market (if a reasonable supply is allowed to continue) to keep all from suffering. Under such conditions as have prevailed for the past several weeks there is an occasional dealer that feels he is neglected. In reality, however, the trouble, when traced back, is found to be not the operator, but a result of failure to accept coal earlier in the season, prior to government control, allowing stocks to become depleted at a season of the year when all coal offered should have been accepted.

Operators and jobbers in this vicinity are considerably exercised over an order coming from Washington in reference to contracts. There is a suggestion that Dr. Garfield intends to abrogate all contracts, and that he will expect that all new contracts will be made by the use of a uniform blank. It is apparent from the reading of the new order that no contract will be allowed to pass that does not bear the official sanction of the fuel administration. It would appear that this should be entirely satisfactory to the trade in general, because the price is fixed by the Government, thereby doing away with the usual yearly practice of expensive negotiations for new contracts. Admittedly the fellow that has been on the level with his connections has nothing to fear, and will be in a position to claim a continuation of favors heretofore enjoyed.

Quotations in the Chicago market are as below, per net ton f.o.b. cars at mines:

	Williamson and Franklin	Saline and Harrisburg	Fulton and Peoria	Springfield	Carterville	Grundy, La Salle, Bureau and Will
Steam and domestic lump, egg, nut, stove, chestnut and pea	$2.65@2.80	$2.65@2.80	$3.00@3.15	$2.65@2.80	$2.65@2.80	$3.35@3.50
Washed egg, stove and nut	2.65@2.80	.....	.....	.....	2.65@2.80	3.35@3.50
Mine-run	2.40@2.55	2.40@2.55	2.75@2.90	2.40@2.55	2.40@2.55	3.10@3.25
Screenings	2.15@2.30	2.15@2.30	2.50@2.65	2.15@2.30	2.15@2.30	2.85@3.00
Washed slack	2.15@2.30	.....	.....	.....	2.15@2.30	2.85@3.00

	Smokeless					
	Clinton and Sullivan	Knox and Greene	Eastern Kentucky	Pocah. and W. Va.	Penna.	Hocking	West. Va. Splint
Dom. and steam lump, egg and nut	$2.65@2.80	$2.65@2.80	$3.10@3.25	$2.60@2.75	$2.60@2.75	$3.05@3.20	$2.85@3.00
Mine-run	2.40@2.55	2.40@2.55	2.85@3.00	2.45@2.60	2.45@2.60	2.70@2.85	2.60@2.75
Screenings	2.15@2.30	2.15@2.30	2.60@2.75	2.10@2.25	2.10@2.25	2.55@2.70	2.35@2.50

MILWAUKEE

Fuel Administrator not responsible for an unauthorized advance. Wisconsin's coal supply protected.

The misunderstanding which resulted in an unauthorized raise of 25c. per ton in coal prices on Dec. 1, for which rebating is now in progress, was not due to any act of the fuel administration office, but was brought about on the strength of a report that President Wilson had requested coal operators to raise prices 35c. per ton.

As a result of the protest made by Gov. Philipp to Administrator Garfield, no more coal will be shipped to the Northwest from Lake Michigan docks. Minnesota and the Dakotas must depend upon the stocks at Duluth-Superior for their future supplies of fuel. It is also settled that Administrator Fitzgerald of Milwaukee will continue to direct the distribution of coal in Wisconsin. He has ordered all coal dealers in the state to report the amount of coal they have sold thus far during the present winter, together with an estimate of the amount they will require to supply consumers until spring. Inquiry is also made as to the extent to which coke and wood are being used.

ST. LOUIS

Car shortage somewhat severe. Transportation slow, but enough coal coming in from Standard district to take care of current needs. Fuel administrators have situation well in hand and future looks more optimistic than it has. No Eastern coals, and tonnage of Carterville exceedingly light.

The situation in the St. Louis market at the present time is exceptionally good. As a matter of fact, reports from all over the country show that St. Louis is in better shape for fuel than any other large city. There is some slight congestion in the terminals on the east side and also on one or two of the trunk lines on the west side, but in a general way the situation is extremely good.

Some coal from the Standard field is coming through to destination in St. Louis in three days.

The local demand, while it exceeds the supply, is nevertheless being taken care of in small quantities. The domestic consumer is in good shape and will continue to be unless there should be a prolonged and unusual siege of severe weather and even in that event Fuel Administrator Crossley expects to be able to handle the situation.

The situation throughout the state is far better than was anticipated two or three weeks ago. To those who criticized the measures taken, the results are surprising. Not only in the State of Missouri, but in Iowa, Nebraska, and Kansas there is coal as the result of Administrator Crossley's excellent work at St. Louis and Kansas City and his forbidding the railroads to confiscate coal without first getting permission. His measures have worked wonders in the local fuel situation.

There is no anthracite coming in to speak of and absolutely no smokeless. Arkansas is almost off of the market. The steam coal condition in and around St. Louis is not satisfactory on account of the failure of the users to get coal stored ahead, but there is no actual shortage that is preventing plants from running full time.

The prevailing circular is, per net ton f.o.b. mine:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
Prepared sizes, lump egg, Nos. 1, 2, 3 and 4 nut washed and unwashed	$2.65@2.80	$2.65@2.80	$2.65@2.80
Mine-run	2.40@2.55	2.40@2.55	2.40@2.55
Screenings and No. 5 nut washed and unwashed	2.15@2.30	2.15@2.30	2.15@2.30

Williamson & Franklin Co. rate is 87½c.; other fields, 72½c.

SEATTLE

Government control of railroads to relieve coal shortage in northwest. May reclassify Washington coals, revise price at mines and declare embargo against Wyoming and Utah coals. Retail prices set in many cities.

Government control of railroads has already had its effect in the Northwest in the saving of fuel through the elimination of heavy passenger equipment from transcontinental lines. Now that the Government is in a position to force dealers to accept coal which will need a minimum of hauling, it is expected that eastern Washington and northern Idaho communities, which have insisted upon being served with Wyoming and Utah coal, will be served with western Washington coal, thereby releasing a number of cars.

Retail prices of coal in various cities of Washington have just been established the most important changes going into effect in Tacoma, where dealers are allowed a margin of $1 a ton over the mine price established for Pierce and King counties, together with freight and tax and delivery charges. Mine prices there are now $3.70 mine run, $4.95 prepared sizes and $3.45 for screenings. Zone delivery charges have been scheduled at from $1 a ton to $2.25, according to the distance of hauling. This would bring the cost of lump coal in Tacoma delivered at the consumer's door from $8.25 to $9.58, a higher price than has prevailed in the city in a number of years. The basis of figuring costs is as follows: Maximum cost, f.o.b. mine, $4.95; brokerage $0.15; freight and tax (from mines nearest to Tacoma freight is 66c. and tax 2c., total, $0.68); dealer's margin, $1, total, $7.28, to which must be added delivery charges of from $1 to $2.25. Retail prices at Everett are as follows: Black Diamond, prepared furnace, $6.95 to $7.45; Carbonado steam, $8.35 to $8.65; Carbonado lump, $9.55 to $10.05; Newcastle lump and nut, $8.30 to $8.80; Issaquah lump and nut, $7.85 to $8.80; Roslyn mine run, $7.45 to $7.95; Renton lump and nut, $7.90 to $8.65; Wellington lump, $9.70 to $10.20.

FOREIGN MARKETS

England

Coal—In the open market the volume of business passing is still negligible. Some improvement is discernible in demand for Admiralty descriptions.

	New Regulation Prices
Best Welsh steam coal	$8.62
Best seconds	8.27
Seconds	8.08
Best dry coal	7.89
Best Monmouthshires	7.89
Seconds	7.65
Best Cardiff smalls	6.19
Cargo smalls	5.47

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—There has been some slight improvement in the tonnage position.

Gibraltar	$24.30	Port Said	48.60
Marseilles	21.79	Las Palmas	20.02
Genoa	24.60	St. Vincent	20.64
Alexandria	42.50	River Plate	29.15
Naples	23.86		

Reported by Hull, Blyth & Co. of London and Cardiff, under date of Dec. 20, 1917.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

CINCINNATI	Jan. 5 1918	One Month Ago	One Year Ago
PIG IRON—Below are the present quotations, with a comparison of a month and a year ago:			
No. 2 Southern foundry....	$35.90	$33.00	$18.90
No. 2 Northern foundry....	35.90	33.00	21.76
NEW YORK			
No. 2X Northern foundry..	34.25	34.25	22.00
No. 2 plain Northern foundry	33.75	33.75	21.00
No. 2 Southern foundry....	37.25	37.25	22.00
BIRMINGHAM			
No. 2 Southern foundry....	33.00	33.00	16.00
CHICAGO			
No. 2 Northern foundry....	33.00	33.00	22.00
No. 2 Southern foundry....	37.00	37.00	....
PITTSBURGH			
Bessemer iron*	37.25	37.25	24.95
Basic iron*	33.95	33.95	20.95

*These prices include the freight charge from the valley to the Pittsburgh district. †Delivered Tidewater. New York.

Note—On Sept. 24 the President approved the new schedule of steel prices, that of pig iron being set at $33.

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill, Pittsburgh	New York Jan. 5, 1918	New York 1 Year Ago	St. Louis	Chicago
Beams, 3 to 15 in.....	$3.00	$4.195	$3.25	$4.27	$4.20
Channels 3 to 15 in.....	3.00	4.195	3.25	4.27	4.20
Angles, 3 to 6 in., ¼ in. thick	3.00	4.195	3.25	4.27	4.20
Tees, 3 in. and larger.....	3.05	4.245	3.40	4.27	4.25
Plates	3.225	4.45	4.00	4.52	4.45

BAR IRON—Prices in cents per pound at cities named are as follows:

	Pittsburgh	St. Louis	Denver	Birmingham
Dec. 31, 1917.....	3.50	4.45	4.05	4.50

NAILS—Prices per keg from warehouse in cities named:

	Mill, Pittsburgh	St. Louis	Denver	Chicago	San Francisco	Dallas
Wire	$2.70	$4.30	$4.85	$4.25	$4.60	$4.50
Cut	2.70	5.25	....	4.40	6.15	....

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh Jan. 5, 1918	Pittsburgh One Year Ago	Chicago	St. Louis	San Francisco	Birmingham	Denver
Standard railroad spikes, ⅞-in. and larger...	$5.00–7.00	$2.65	$5.00	$6.45	$7.25	$8.00	$5.40
Track bolts	7.00–8.00	3.25	6.25	Premium	8.80	6.75	6.15
Standard section angle bars	3.50	2.00	4.50	Premium	4.65	...	5.00

COLD DRAWN STEEL SHAFTING—From warehouse to consumers requiring fair-sized lots, the following discounts held on Apr. 30, 1917:

Cleveland	Chicago	St. Louis	Denver	Birmingham
List	+10%	+10%	+35%	+30%

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill, Pittsburgh	Chicago	St. Louis	Denver	Birmingham
Straight	$4.75	$6.50	$5.50	$7.50	$6.75
Assorted	4.90	6.50–7.00	5.75	7.75	7.00

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Jan. 5, 1918	New York 1 Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in.	$58.35	$59.50	$44.50	$55.15	$57.00	$66.40	$62.00
6 in. and over	55.35	56.50	41.50	53.15	54.00	63.40	59.00

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Jan. 5, 1918	Pittsburgh One Year Ago	Chicago Jan. 5, 1918	Chicago One Year Ago
Standard bessemer rails.....	....	$38.00	....	$38.00
Standard openhearth rails...	....	40.00	....	40.00
Light rails, 8 to 10 lb.....	....	52.00	....	47.00
Light rails, 12 to 14 lb.....	....	52.00	....	46.00
Light rails, 25 to 45 lb.....	....	50.00	....	44.00

Note—No quotations. Cambria Steel Co. and Carnegie Steel Co. reported to be filled up on rails for a year.

OLD MATERIAL—Prices per net ton in Chicago and St. Louis (including delivery to buyer's works and freight transfer charges):

	Chicago Jan. 5, 1918	Chicago One Month Ago	St. Louis Jan. 5, 1918	St. Louis One Month Ago
No. 1 railroad wrought...	$29.50	$25.00	$31.00	$30.50
Stove plate	16.00	15.50	16.50	16.50
No. 1 machinery cast.....	20.00	20.50	21.50	19.00
Machine shop turnings...	16.50	16.50	16.75	16.75
Cast borings	16.50	16.50	16.00	16.50
Railroad malleable cast...	26.50	26.00	25.50	25.50

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Chicago	Birmingham	St. Louis	Denver
$0.12	$0.09	$0.16	$0.15	$0.16

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Chicago
Solid	12c.	14½c.	9c.
Hollow	24c.	23½c.	..

PIPE—The following discounts are for carload lots f.o.b. Pittsburgh; basing card of Nov. 6, 1917, for steel pipe and for iron pipe:

BUTT WELD

Steel Inches	Black	Galvanized	Iron Inches	Black	Galvanized
⅛, ¼ and ⅜..	44%	17%	¾ to 1½.....	33%	17%
½	48%	33½%			
¾ to 3.....	51%	37½%			

LAP WELD

2	44%	31½%	2	26%	12%
2½ to 6.....	47%	34½%	2½ to 4.....	28%	15%
			4½ to 6.....	28%	15%

BUTT WELD, EXTRA STRONG PLAIN ENDS

⅛, ¼ and ⅜..	40%	22½%	¾ to 1½.....	33%	18%
½	45%	36½%			
¾ to 1½.....	49%	36½%			

LAP WELD, EXTRA STRONG PLAIN ENDS

2	42%	30½%	2	27%	14%
2½ to 4.....	45%	33½%	2¼ to 4.....	29%	17%
4½ to 6.....	44%	32½%	4½ to 6.....	28%	16%

From warehouses at the places named the following discounts hold for steel pipe:

	Black New York	Black Chicago	Black St. Louis
¾ to 3 in. butt welded.....	38%	42.8%	40.1%
3½ to 6 in. lap welded.....	18%	38.8%	36.1%

	Galvanized New York	Galvanized Chicago	Galvanized St. Louis
¾ to 3 in. butt welded.....	22%	27.8%	25.1%
3½ to 6 in. butt welded.....	List	24.8%	22.1%

Malleable fittings, Class B and C, from New York stock sell at list price. Cast iron, standard sizes, 15 and 5%.

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair-sized orders, the following amount is deducted from list:

	New York Jan. 5, 1918	New York One Year Ago	Cleveland Jan. 5, 1918	Cleveland One Year Ago	Chicago Jan. 5, 1918	Chicago One Year Ago
Hot pressed square...	List	$0.50	$1.40	$2.75	$1.50	$3.00
Hot pressed hexagon..	List	.50	1.20	2.75	.85	3.00
Cold punched square..	List	.50	.75	3.00	1.50	2.50
Cold punched hexagon	List	.50	.75	3.00	1.50	3.00

Semifinished nuts sell at the following discounts from list price:

	Dec. 31, 1917	One Year Ago
New York	40%	50%
Cleveland	60%	50—10%
Chicago	50%	50—10%
St. Louis	50%	.....

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago
⅜ by 4 in. and smaller.....	30%	50%	40—10%
Larger and longer up to 1 in. by 30 in.	15%	40%	30—5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:

New York ..... $1.00 Cleveland ..... $3.50 Chicago $3.00

For cast-iron washers the base price per 100 lb. is as follows:

New York ..... $5.00 Cleveland ..... $4.50 Chicago $3.50

RIVETS—The following quotations are allowed for fair-sized orders from warehouse:

	New York	Cleveland	Chicago
Steel ⅞ and smaller.....	30%	30%	40%*
Tinned	30%	30%	40%*

*For less than keg lots the discount is 35%.

Button heads, ¾, ⅞, 1 in. diameter by 2 in. to 5 in., sell as follows per 100 lb.:

New York ..... $7.00 Cleveland ..... $6.15 Chicago $5.50

Coneheads, same sizes:

New York ..... $7.10 Cleveland ..... $6.25 Chicago $5.60

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	Chicago	St. Louis	Birmingham	Denver
Cup	7	5¼	5.6	8½	10
Fiber or sponge.....	8	6	5.9	15	15
Transmission	7	6	5.9	10	15
Axle	4½	4	3.3	3	5
Gear	4½	4½	6	5½	5½
Car journal	23 (gal.)	3½	3.75	5	5

BABBITT METAL—Warehouse prices in cents per pound:

	New York		Cleveland		Chicago	
	Jan. 5, 1918	One Year Ago	Jan. 5, 1918	One Year Ago	Jan. 1, 1918	One Year Ago
Best grade	70.00	60.00	93.00	51.25	70.00	50.00
Commercial	40.00	30.00	21.50	18.50	25.00 to 30.00	20.00

HOSE—Following are prices of various classes of hose:

Fire

	50-Ft. Lengths
Underwriters' 2½-in.	65c. per ft.
Common, 2½-in.	40–10%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft.	$0.55	$0.30	$0.25

Steam—Discounts from list

First grade... 30% Second grade... 30-5% Third grade... 40-10%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
St. Louis	45%	40%
Denver	40%	40%
Birmingham	35%	40%
Chicago	30—10%	40—5%

RAWHIDE LACING—40% off list.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$0.77
Asbestos for high-pressure steam	1.54
Duck and rubber for piston packing	.88
Flax, regular	.66
Flax, waterproofed	.99
Compressed asbestos sheet	.99
Wire insertion asbestos sheet	1.21
Rubber sheet, ¼	.55
Rubber sheet, wire insertion	.88
Rubber sheet, duck insertion	.44
Rubber sheet, cloth insertion	.25
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.10
Asbestos wick, ½- and 1-lb. balls	.65 to .70

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York	St. Louis
Galvanized iron rigging	List + 20%	+20%
Galvanized cast steel rigging	Net List	List
Bright plain rigging	30%	30%
Bright cast steel	17½%	17½%
Bright iron and iron tiller	5%	5%

MANILA ROPE—For rope smaller than ⅝-in. the price is ½ to 2c. extra; while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ⅝-in., 8 ft.; ¾-in., 6; ⅞-in., 4½; 1 in., 3½; 1⅛-in., 2 ft. 10 in.; 1¼-in., 2 ft. 4 in. Following is the price per pound for ⅝-in. and larger, in 1200-ft. coils:

Boston	$0.35½	Kansas City	$0.33½
New York	.34	Los Angeles	.33½
Chicago	.32½	Seattle	.33½
Denver	.35½	St. Louis	.33
Birmingham	.36		

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING		BLOCKS AND SHEETS	
Pipe Size	Standard Thickness Per Lin.Ft.	Thickness	Price per Sq.Ft.
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
6-in.	.80	1½-in.	.45
4-in.	.60	2 -in.	.60
3-in.	.45	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in.	1.05

85% magnesia high pressure ..... 15% off

For low-pressure heating and return lines ..... 4-ply .... 58% off; 3-ply .... 60% off; 2-ply .... 62% off

LINSEED OIL—These prices are per gallon:

	New York		Cleveland		Chicago		
	Jan. 5, 1918	One Year Ago	Jan. 5, 1918	One Year Ago	Jan. 5, 1918	One Year Ago	St. Louis
Raw in barrels	$1.28	$0.96	$1.25	$1.00	$1.26	$1.03	$1.26
5-gal. cans	1.38	1.00	1.40	1.10	1.36	1.13	1.29

WHITE AND RED LEAD in 500-lb. lots sell as follows in cents per pound:

	Red				White	
	Jan. 5, 1918		1 Year Ago		Jan. 5, 1918	1 Yr. Ago
	Dry	In Oil	Dry	In Oil	Dry and In Oil	Dry and In Oil
25- and 50-lb. kegs	11.50	11.00	10.50	11.00	10.50	10.50
12½-lb. keg	11.75	11.25	10.75	11.25	10.75	10.75
100-lb. keg	11.25	11.50	11.00	11.50	11.00	11.00
1- to 5-lb. cans	13.25	13.00	12.50	12.50	13.00	12.50

CALCIUM CARBIDE—Price f.o.b. cars at warehouse points in Eastern [illegible] per ton for Union miners' lamp carbide, and $97.50 per [illegible] miners' lamp carbide. Union sells in 25-lb. cans for [illegible] per can.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Cincinnati	$13.50	Birmingham (clay)	$8.00
St. Louis, salmon	8.00	Birmingham (shale)	9.00
Denver	8.00		

FUEL OIL—Price variable, depending upon stock. New York quotations not available owing to this fact. In Chicago and St. Louis the following prices are quoted:

	Chicago	St. Louis
Domestic light, 22-26 Baumé	5½c.	7½c.
Mexican heavy, 12-14 Baumé	7c.	none

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York and Chicago:

	1-Ply		2-Ply		3-Ply	
	c.l.	c.cl.	c.l.	l.cl.	c.l.	l.cl.
No. 1 grade	$1.15	$1.40	$1.45	$1.60	$1.75	$1.90
No. 2 grade	1.10	1.25	1.25	1.40	1.50	1.65

Asbestos asphalt-saturated felt (14 lb. per square) costs $6.50 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $1.85 per roll in carload lots and $2.10 for smaller quantities.

Shingles, red and green slate finish, cost $4.75 per square in carloads, $5 in smaller quantities, in Philadelphia.

ROOFING MATERIALS—Prices per ton f.o.b. New York or Chicago:

	Carload Lots	Less Than Carload Lots
Tar felt (14 lb. per square of 100 sq.ft.)	$61.00	$62.00
Tar pitch (in 400-lb. bbl.)	15.00	16.50
Asphalt pitch (in barrels)	29.00	30.50
Asphalt felt	60.00	62.00

STEEL SHEET PILING—The following price is base per 100 lb. f.o.b. Pittsburgh, with a comparison of a month and a year ago:

Dec. 31, 1917	One Month Ago	One Year Ago
$4.50 to $5.00	$4.50 to $5.00	$2.60 to $2.70

HOLLOW TILE—The price per 1000 in carload lots f.o.b. mine is as follows:

	4 x 12 x 12	8 x 12 x 12
St. Louis	$79.00	$135.00
Chicago	79.00	137.00
Denver, per ton	110.00	200.00
Kansas City	58.00	112.00
St. Paul	55.00	138.00
Boston	95.00	171.00
Birmingham	56.80	106.50

LUMBER—Price of yellow pine per M in carload lots:

	1-In. Rough, 10 In. x 16 Ft.	2-In. T. and G.	8 x 8 In. x 20 Ft.
St. Louis	$32.00	$29.00	$30.00
Birmingham	29.50	32.50	41.75

Price per M in carload lots:

	1-In. Rough, 10 In. x 16 Ft. and Under			2-In. T. and G. 10 In. x 16 Ft.	
	Y.P.	Fir	Hemlock	Y.P.	Fir
Boston	$45.00	....	....	$50.00	$50.00
Cincinnati	35.00	....	....	37.50	....
Kansas City	43.00	$50.00	$50.00	51.00	55.00
Seattle	....	27.00	27.00	27.00	27.00
New Orleans	36.00	....	....	28.00	....
St. Paul	....	53.00	34.00	61.00	37.50
Denver	....	30.00	30.00	....	32.00

	8 x 8-In. x 20 Ft. and Under				12 x 12-In., 20 Ft. and Under	
	Y.P.	Fir	Hemlock	Spruce	Y.P.	Fir
Boston	$52.50	$52.50	....	$40.00	$60.00	$60.00
Cincinnati	35.00	....	....	....	35.50	....
Kansas City	42.00	34.00	....	....	48.00	35.00
Seattle	27.00	27.00	$27.00	27.00	27.00	27.00
New Orleans	28.00	....	....	....	38.00	....
St. Paul	....	38.00	38.00	38.00	....	51.00
Denver	....	34.00	....	30.00	....	36.00

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire:

	Denver			St. Louis			Birmingham		
No.	Single Braid	Double Braid	Duplex	Single Braid	Double Braid	Duplex	Single Braid	Double Braid	Duplex
14	$11.40	$14.75	$28.90	$13.50	$16.00	$26.00	$11.50	$17.90	$36.40
10	23.30	26.50	52.55	26.00	29.00	....	30.80	34.30	67.60
8	33.10	36.70	73.20	35.00	40.50	....	42.85	46.85	....
6	....	56.20	....	....	65.35	....	69.60	74.10	....
4	....	80.55	....	....	93.65	....	101.75	106.05	....
2	....	120.30	....	....	140.50	....	156.50	163.00	....
1	....	156.25	....	....	182.50	....	201.00	209.50	....
0	....	187.05	....	....	241.00	....	276.00	285.00	....
00	....	252.65	....	....	294.50	....	317.00	330.00	....
000	....	309.35	....	....	360.50	....	417.00	428.50	....
0000	....	376.75	....	....	439.50	....	508.00	516.00	....

EXPLOSIVES—Price per pound in 200-lb. lots at cities named:

	Low Freezing 20%	Gelatin 40%	Gelatin 60%	Gelatin 80%	Black Powder*
New York	.....	$0.27½	$0.34½	.....	$2.50
Boston	.....	.....	.36¼	$0.43¾	....
Kansas City	$0.20	.26¼	.33¼	.43¼	....
Los Angeles	.20	.27	.35	.....	....
Seattle	.18½	.24¾	.31¾	.41¾	....
Chicago	.19¾	.23¾	.33	.43	2.45
St. Paul	.20	.26¼	.33¼	.....	2.55
St. Louis	.20	.26¼	.33¼	.43¼	2.05
Denver	.19	.25¼	.32¼	.42¼	....
Dallas	.25	.29	.39	.49	....

*Keg.

FREIGHT RATES—On finished steel products in the Pittsburgh district, including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc., the following freight rates are effective in cents per 100 lb.:

Boston	21.5	Minneapolis	35.5
Buffalo	11.6	New Orleans	30.7
Chicago	21.5	New York	19.5
Cincinnati	18.5	Pacific Coast (all rail)	90.0
Cleveland	13.5	Philadelphia	18.5
Denver	79.0	St. Louis	27.0
Kansas City	47.0	St. Paul	35.5